

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6, D 12
Edition : 08.06.90
Replaces : -
Test oil : ISO-4113

Combination no. : 0 403 446 246A

Injection pump
Pump designation : PES6MW100/720RS1144
EP type number : 0 413 406 138
Governor
Governor design. : RQV300...1300MW50-6
Governor no. : 0 420 083 209

Customer-spec. information
Customer : MB-NFZ

Engine : OM366A

1st version kW : 125.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
: (3.65...3.85)
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300
Rack travel in mm : 11.00...11.10
Del.quantity cm³/ : 7.7...7.9
100 s: (7.5...8.1)

Spread cm³ : 0.3
100 s: (0.6)

2nd speed rpm : 300.0
Rack travel in mm : 8.0...8.2
Del.quantity cm³/ : 0.9...1.3
100 s: (0.6...1.5)

Spread cm³ : 0.3
100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1430
travel mm : 9.30...9.70
2nd speed rpm : 1340
travel mm : 8.50...8.70
3rd speed rpm : 500
travel mm : 2.70...3.30
4th speed rpm : 300
travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1300
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1300
Aneroid pressure h: 800
Del.quantity : 77.0...79.0
1000 : (75.0...81.0)

Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 108...116

Testing:
1st rack travel in: 10.00
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1425...1455
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 78...86
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 8.1

Testing:
Speed rpm : 100
Minimum rack travel: 9.20
Speed rpm : 300
Rack travel in mm : 8.00...8.20

TORQUE CONTROL
Dimension a mm : 1.20
Torque control curve - 1st version
1st speed rpm : 1300
Rack travel in m: 10.90...11.00
2nd speed rpm : 800
Rack travel in m: 11.80...12.00
3rd speed rpm : 585
Rack travel in m: 12.00...12.20
4th speed rpm : 1100
Rack travel in m: 11.10...11.30

Aneroid/Altitude
Compensator Test

1st version
Pressure hPa : -
Rack travel mm : 8.50...8.60

1st pressure hPa : 180
Rack travel in m: 9.00...9.10
2nd pressure hPa : 450
Rack travel in m: 11.10...11.40
3rd pressure hPa : 800
Rack travel in m: 12.00...12.20

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

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Aneroid pressure h: 800
Speed rpm : 800
Del.quantity cm3/ : 76.0...78.0
1000 s: (74.0...80.0)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: 800
Speed rpm : 585
Del.quantity cm3/ : 68.5...71.5
1000 s: (66.0...74.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 20.0...22.0
1000 s: (18.0...24.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.00
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 78.0...88.0
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 8.00...8.20
Del.quantity cm3/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 2,8 T 2
 Edition : 06.07.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 446 253
 Injection pump
 Pump designation : PES6MW100/320RS1176
 EP type number : 0 413 406 158
 Governor
 Governor design. : RQV275...1250MW80-6
 Governor no. : 0 420 083 215

Customer-spec. information
 Customer : RVI

Engine : MIDR 060226H

1st version kW : 143.0
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 2 417 413 033

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 11.40...11.50

Del.quantity cm³/ : 9.9...10.1

100 s: (9.7...10.3)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 275.0

Rack travel in mm : 6.60...6.80

Del.quantity cm³/ : 2.0...2.4

100 s: (1.7...2.6)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 8.90...9.30

2nd speed rpm : 1325

travel mm : 8.00...8.20

3rd speed rpm : 500

travel mm : 3.00...3.60

4th speed rpm : 275

travel mm : 1.00...1.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1320

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 750

Del.quantity : 99.0...101.0

1000 : (97.0...103.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 50...58

Testing:

1st rack travel in: 10.40
Speed rpm : 1335...1345
2nd rack travel in: 4.00
Speed rpm : 1450...1480
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 15...23
Setting point w/out bumper spring
Speed rpm : 275
Rack travel in mm : 6.7

Testing:

Speed rpm : 200
Minimum rack travel: 7.00
Speed rpm : 275
Rack travel in mm : 6.60...6.80

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 750
Rack travel mm : 11.40...11.50

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.60...9.70
2nd pressure hPa : 150
Rack travel in m: 9.90...10.00
3rd pressure hPa : 300
Rack travel in m: 10.90...11.20

START CUT-OUT

Speed 1/min : 200 (220)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 750
Speed rpm : 750
Del.quantity cm3/ : 94.5...97.5
1000 s: (92.0...100.0)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm3/ : 51.0...53.0
1000 s: (49.0...55.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.40
Speed rpm : 1335...1345

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 88.0...102.0
1000 s: (85.0...105.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 275
Rack travel in mm : 6.60...6.80
Del.quantity cm3/ : 20.0...24.0
1000 s: (17.5...26.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

Set start-of-delivery sensor at pre-stroke to 3.50...3.60 mm for cylinder 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6, D D 89
 Edition : 01.06.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 446 257
 Injection pump
 Pump designation : PES6MW100/72ORS1144
 EP type number : 0 413 406 138
 Governor
 Governor design. : RQV300...1300MW50-7
 Governor no. : 0 420 083 221

Customer spec. information
 Customer : MB-NFZ

Engine : OM366A

1st version kW : 125.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)
 Rack travel in mm : 9.00...12.00

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Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.90...11.00

Del.quantity cm3/ : 7.2...7.4

100 s: (7.0...7.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.8...7.9

Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.50...8.70

2nd speed rpm : 1450

travel mm : 9.50...9.90

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 900

Del.quantity : 72.0...74.0

1000 : (70.0...76.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 108...116

Testing:
1st rack travel in: 9.90
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1425...1455
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 77...85
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 7.8

Testing:
Speed rpm : 100
Minimum rack travel: 9.30
Speed rpm : 300
Rack travel in mm : 7.80...7.90

CONSTANT REGULATION
Speed rpm : 330...500

TORQUE CONTROL
Dimension a mm : 1.00
Torque control curve - 1st version
1st speed rpm : 1300
Rack travel in m: 10.90...11.00
2nd speed rpm : 800
Rack travel in m: 11.60...11.80
3rd speed rpm : 585
Rack travel in m: 11.80...12.00

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.50...8.60

Measurement
Speed 1/min : 500

1st pressure hPa : 300
Rack travel in m: 10.00...10.10
2nd pressure hPa : 500
Rack travel in m: 11.20...11.50
3rd pressure hPa : 900
Rack travel in m: 11.80...12.00

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 800
Del.quantity cm3/ : 71.0...73.0
1000 s: (69.0...75.0)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: 900
Speed rpm : 585
Del.quantity cm3/ : 65.0...68.0
1000 s: (62.5...70.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 20.0...22.0
1000 s: (18.0...24.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.90
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 78.0...88.0
1000 s: (75.0...91.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 7.80...7.90
Del.quantity cm3/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6, D D 58
 Edition : 29.06.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 446 258
 Injection pump
 Pump designation : PES6MW100/720RS1129
 EP type number : 0 413 406 121
 Governor
 Governor design. : RGV300...1300MW50-8
 Governor no. : 0 420 083 222

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 149.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 345 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.40...11.50

Del.quantity cm3/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.5...5.6

Del.quantity cm3/ : 0.9...1.1

100 s: (0.6...1.4)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1340

travel mm : 8.60...8.80

2nd speed rpm : 1430

travel mm : 9.30...9.70

3rd speed rpm : 300

travel mm : 1.20...1.60

4th speed rpm : 700

travel mm : 3.80...4.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1340

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 101.0...103.0

1000 : (99.0...105.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 116...124

Testing:

1st rack travel in: 10.40
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1440...1470
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 82...90
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.5

Testing:

Speed rpm : 100
Minimum rack travel: 7.50
Speed rpm : 300
Rack travel in mm : 5.50...5.60

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

CONSTANT REGULATION

Speed rpm : 320...530

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 300
Rack travel mm : 8.30...8.50

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 7.40...7.50
2nd pressure hPa : 450
Rack travel in m: 10.10...10.30
3rd pressure hPa : 700
Rack travel in m: 11.40...11.50

START CUT-OUT

Speed 1/min : 220 (230)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

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Speed rpm : 600
Del.quantity cm3/ : 85.5...88.5
1000 s: (83.0...91.0)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 27.0...29.0
1000 s: (25.0...31.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.40
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 88.0...98.0
1000 s: (85.0...101.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.50...5.60
Del.quantity cm3/ : 9.0...11.0
1000 s: (6.0...14.0)
Spread cm3 : 3.50
1000 s: (5.00)

Remarks:

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BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6, D 65
 Edition : 29.06.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 446 259
 Injection pump
 Pump designation : PES6MW100/72ORS1131-1
 EP type number : 0 413 406 165
 Governor
 Governor design. : RGV300...1300MW68-2
 Governor no. : 0 420 083 224

Customer-spec. information
 Customer : MB-NFZ

Engine : OM366LA

1st version kW : 177.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.40...14.50

Del.quantity cm³/ : 11.4...11.6

100 s: (11.2...11.8)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm³/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.30...9.70

2nd speed rpm : 1350

travel mm : 8.40...8.60

3rd speed rpm : 600

travel mm : 3.90...4.50

4th speed rpm : 300

travel mm : 0.80...1.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 114.0...116.0

1000 : (112.0...118.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 116...124

Testing:
1st rack travel in: 13.40
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1480...1510
4th rack travel in: 1600
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 78...86
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.4

Testing:
Speed rpm : 100
Minimum rack travel: 9.00
Speed rpm : 300
Rack travel in mm : 6.30...6.50

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.20...10.30

Measurement
Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 11.50...11.70
2nd pressure hPa : 400
Rack travel in m: 13.00...13.20
3rd pressure hPa : 1000
Rack travel in m: 14.40...14.50

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 750
Del.quantity cm3/ : 106.5...109.5
1000 s: (104.0...112.0)
Spread cm3 : 5.00
1000 s: (7.0)

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 35.0...37.0
1000 s: (33.0...39.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 13.40
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 100.0...110.0
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.30...6.50
Del.quantity cm3/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 35
 Edition : 06.07.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 446 260
 Injection pump
 Pump designation : PES6MM100/720RS1120
 EP type number : 0 413 406 112
 Governor
 Governor design. : RQV300...1300MW50-9
 Governor no. : 0 420 083 223

Customer-spec. information
 Customer : MB-NFZ

Engine : OM366LA

1st version kW : 149.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 10.8...11.0

100 s: (10.6...11.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 0.9...1.3

100 s: (0.7...1.5)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.40...10.00

2nd speed rpm : 1350

travel mm : 8.50...8.70

3rd speed rpm : 450

travel mm : 2.40...3.00

4th speed rpm : 300

travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1340

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 108.0...110.0

1000 : (106.0...112.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control Lever
position degrees: 111...119

Testing:

1st rack travel in: 12.90
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1460...1490
4th rack travel in: 1530
Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever
position degrees: 76...84
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.5

Testing:

Speed rpm : 100
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 320...550

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.10...8.10

Measurement

Speed 1/min : 500

1st pressure hPa : 280
Rack travel in m: 9.40...9.60
2nd pressure hPa : 600
Rack travel in m: 12.50...12.70
3rd pressure hPa : 1000
Rack travel in m: 13.90...14.00

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 750
Del.quantity cm³/ : 98.0...102.0
1000 s: (96.0...104.0)

Spread cm³ : 3.50
1000 s: (6.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 21.0...23.0
1000 s: (19.0...25.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.90
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 90.0...100.0
1000 s: (87.0...103.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.40...6.60
Del.quantity cm³/ : 9.0...13.0
1000 s: (7.0...15.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 7,2 W
Edition : 06.07.90
Replaces : 02.05.90
Test oil : ISO-4113

Combination no. : 0 403 456 109

Injection pump
Pump designation : PES6MW100/321RS1200
EP type number : 0 413 406 189
Governor
Governor design. : RQV250...1200MW83-2
Governor no. : 0 420 083 216

Cust. part no. : 3-7036

Customer-spec. information
Customer : MAN

Engine : D 0826 LF02

1st version kW : 169.0
Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
: (3.45...3.65)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 13.7...13.9

100 s: (13.5...14.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 4.9...5.1

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250

travel mm : 10.50...10.60

2nd speed rpm : 810

travel mm : 5.90...6.10

3rd speed rpm : 500

travel mm : 3.70...4.30

4th speed rpm : 250

travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1225

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 137.0...139.0

1000 : (135.0...141.0)

Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 120...128

Testing:

1st rack travel in: 11.50
Speed rpm : 1245...1260
2nd rack travel in: 4.00
Speed rpm : 1300...1330
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 77...85
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 5.0

Testing:

Speed rpm : 100
Minimum rack travel: 6.50
Speed rpm : 250
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 330...420

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 170
Rack travel mm : 10.00...10.10

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.70...9.80
2nd pressure hPa : 550
Rack travel in m: 11.90...12.20
3rd pressure hPa : 1000
Rack travel in m: 12.50...12.60

START CUT-OUT

Speed 1/min : 170 (200)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm3/ : 135.0...138.0
1000 s: (132.5...140.5)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: 1000
Speed rpm : 800
Del.quantity cm3/ : 138.0...141.0
1000 s: (135.5...143.5)
Speed rpm : 1200
Del.quantity cm3/ : 136.0...139.0
1000 s: (133.5...141.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 74.0...76.0
1000 s: (72.0...78.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.50
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...140.0
1000 s: (127.0...143.0)

LOW IDLE

Speed rpm : 250
Rack travel in mm : 4.90...5.10
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

: MAN # 3-7036
Start-of-delivery mark at 14° angular
displacement of the cam after start of
delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 7,2 V
 Edition : 06.07.90
 Replaces : 02.05.90
 Test oil : ISO-4113
 Combination no. : 0 403 456 110
 Injection pump
 Pump designation : PES6MW100/321RS1201
 EP type number : 0 413 406 190
 Governor
 Governor design. : RQ250/1200MW84-3
 Governor no. : 0 420 082 043

Cust. part no. : 3-7047

Customer-spec. information
 Customer : MAN

Engine : D 0826 LF02

1st version kW : 165.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 15.00...0.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 13.7...13.9

100 s: (13.5...14.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.5

100 s: (0.7)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1300

travel mm : 8.40...8.80

2nd speed rpm : 1260

travel mm : 6.60...6.80

3rd speed rpm : 345

travel mm : 4.00...4.60

4th speed rpm : 250

travel mm : 1.80...2.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 1000

Rack travel in mm : 18.20...19.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 137.0...139.0

1000 : (135.0...141.0)

Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 92...100

Setting point:
Speed rpm : 1000
Rack travel in mm : 19.0

Testing:
1st rack travel in: 11.50
Speed rpm : 1245...1260
2nd rack travel in: 4.00
Speed rpm : 1300...1330
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 69...77
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 5.5

Testing:
Speed rpm : 100
Minimum rack travel: 7.00
Speed rpm : 250
Rack travel in mm : 5.40...5.60

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 12.50...12.60
2nd speed rpm : 600
Rack travel in m: 12.60...12.80
3rd speed rpm : 800
Rack travel in m: 12.50...12.80
4th speed rpm : 1200
Rack travel in m: 12.20...12.40

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 170
Rack travel mm : 10.20...10.30

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.00...10.10

2nd pressure hPa : 550
Rack travel in m: 11.90...12.20
3rd pressure hPa : 1000
Rack travel in m: 12.60...12.80

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm³/ : 135.0...138.0
1000 s: (132.5...140.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: 1000
Speed rpm : 800
Del.quantity cm³/ : 138.0...141.0
1000 s: (135.5...143.5)
Speed rpm : 1200
Del.quantity cm³/ : 134.5...137.5
1000 s: (132.0...140.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 74.0...76.0
1000 s: (72.0...78.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.50
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 130.0...140.0
1000 s: (127.0...143.0)

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 5.00
1000 s: (7.00)

Remarks:
: MAN # 3-7047
Start-of-delivery mark = 13,5° after
start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a
 Edition : 03.07.90
 Replaces : 10.86
 Test oil : ISO-4113
 Combination no. : 9 400 083 449
 Injection pump
 Pump designation : PES6A100D320/3RS2691
 EP type number : 9 410 230 025
 Governor
 Governor design. : RSV400...1100A2C2209
 R
 Governor no. : 9 420 083 201

Customer-spec. information
 Customer : CUMMINS

Engine : 6 CT 8.3 L

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...7.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.30...10.40

Del.quantity cm3/ : 9.0...9.2

100 s: (8.8...9.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.7...5.9

Del.quantity cm3/ : 1.6...2.0

100 s: (1.4...2.3)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 90.0...92.0

1000 : (88.0...94.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 85...93

Testing:

1st rack travel in: 9.30
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1300
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.3

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 400
Rack travel in mm : 5.70...5.90
Rack travel in mm : 2.00
Speed rpm : 495...555

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 10.30...10.40
2nd speed rpm : 500
Rack travel in m: 10.30...10.50
5th speed rpm : 400
Rack travel in m: 10.70...11.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500
Del.quantity cm³/ : 74.0...77.0
1000 s: (71.5...79.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.30
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...149.0
1000 s: (132.0...152.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.70...5.90

Del.quantity cm³/ : 16.5...20.5
1000 s: (14.0...23.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

Start of delivery - engine 11° before
TDC

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 5,7 o 4
 Edition : 03.07.90
 Replaces : 1.86
 Test oil : ISO-4113
 Combination no. : 9 400 085 254
 Injection pump
 Pump designation : PES6A90D410RS2293
 EP type number : 0 410 896 031
 Governor
 Governor design. : RSV500...900A0B2211-
 1L
 Governor no. : 9 420 083 204

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM 352 (A)

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25
 : (2.10...2.30)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 880
 Rack travel in mm : 10.00...10.10
 Del.quantity cm3/ : 5.7...5.8
 100 s: (5.5...6.0)
 Spread cm3 : 0.3
 100 s: (0.5)

2nd speed rpm : 500.0
 Rack travel in mm : 6.4...6.6
 Del.quantity cm3/ : 1.0...1.4
 100 s: (0.8...1.6)
 Spread cm3 : 0.2
 100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 880
 Del.quantity : 57.0...58.0
 1000 : (55.0...60.0)
 Spread cm3 : 3.00
 1000 : (5.00)

RATED SPEED

1st version
 Control lever
 position degrees: 83...91

Testing:
 1st rack travel in: 9.00
 Speed rpm : 905...910
 2nd rack travel in: 4.00
 Speed rpm : 950...955
 4th rack travel in: 1100
 Speed rpm : 0.30...1.70

LOW IDLE 1

Control Lever
position degrees: 71...79
Setting point w/out bumper spring
Speed rpm : 500
Rack travel in mm : 6.00

Testing:
Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 500
Rack travel in mm : 6.40...6.60
Rack travel in mm : 2.00
Speed rpm : 535...595

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 880
Rack travel in m: 10.00...10.10
2nd speed rpm : 500
Rack travel in m: 10.00...10.20
4th speed rpm : 400
Rack travel in m: 11.40...11.60

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.00
Speed rpm : 905...910

STARTING FUEL DELIVERY

Speed rpm : 100
Rack travel in mm : 14.20...14.80

LOW IDLE

Speed rpm : 500
Rack travel in mm : 6.40...6.60
Del.quantity cm3/ : 10.0...14.0
1000 s: (8.0...16.0)
Spread cm3 : 2.50
1000 s: (4.50)

Remarks:

:

APPLICATION

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 3,9 d 1
Edition : 03.07.90
Replaces : -
Test oil : ISO-4113
Combination no. : 9 400 085 313
Injection pump
Pump designation : PES4A90D32ORS2744
EP type number : 9 400 084 012
Governor
Governor design. : RSV350...1150A2B2129
-8R
Governor no. : 9 420 083 241

Customer-spec. information
Customer : MWM

Engine : TD 229 EC-4

1st version kW : 73.6
Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 1 417 413 046

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80
: (2.65...2.85)

Rack travel in mm : 9.00...12.00
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
& maximum rack tra: 21.00
Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 10.50...10.60

Del.quantity cm3/ : 8.6...8.7

100 s: (8.4...8.9)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 1.1...1.5

100 s: (0.9...1.7)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 86.5...87.5

1000 : (84.5...89.5)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever
position degrees: 99...107

Testing:

1st rack travel in: 9.50
Speed rpm : 1190...1200
2nd rack travel in: 4.00
Speed rpm : 1260...1290
4th rack travel in: 1450
Speed rpm : 0.30...1.70

LOW IDLE 1

Control Lever
position degrees: 74...82
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 4.9

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 350
Rack travel in mm : 5.30...5.50
Rack travel in mm : 2.00
Speed rpm : 555...615

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1150
Rack travel in m: 10.50...10.60
2nd speed rpm : 500
Rack travel in m: 10.80...10.90
3rd speed rpm : 800
Rack travel in m: 10.80...10.90
4th speed rpm : 960
Rack travel in m: 10.60...10.80

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500
Del.quantity cm3/ : 80.5...82.5
1000 s: (78.0...85.0)
Speed rpm : 800
Del.quantity cm3/ : 85.0...87.0
1000 s: (82.5...89.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.50
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.30...5.50
Del.quantity cm3/ : 11.0...15.0
1000 s: (9.0...17.0)
Spread cm3 : 2.50
1000 s: (4.50)

Remarks:

: VALMET

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 5,9 L
 Edition : 03.07.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 085 314
 Injection pump
 Pump designation : PES6A90D32ORS2718
 EP type number : 9 400 084 003
 Governor
 Governor design. : RSV350...1150A2B2097
 -2R
 Governor no. : 9 420 083 224

Customer-spec. information
 Customer : MWM

Engine : TD 229 EC-06

1st version kW : 117.8
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 046

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 11.30...11.40

Del.quantity cm³/ : 8.6...8.7

100 s: (8.4...8.9)

Spread cm³ : 0.3

100 s: (0.5)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm³/ : 1.2...1.6

100 s: (1.0...1.8)

Spread cm³ : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 86.5...87.5

1000 : (84.5...89.5)

Spread cm³ : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control Lever
position degrees: 95...103

Testing:
1st rack travel in: 10.30
Speed rpm : 1190...1200
2nd rack travel in: 4.00
Speed rpm : 1255...1285
4th rack travel in: 1450
Speed rpm : 0.30...1.70

LOW IDLE 1
Control Lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.5

Testing:
Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 350
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 575...635

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 11.30...11.40
2nd speed rpm : 500
Rack travel in m: 11.90...12.10
4th speed rpm : 800
Rack travel in m: 11.60...11.80

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 500
Del.quantity cm³/ : 84.5...86.5
1000 s: (82.0...89.0)
Speed rpm : 800
Del.quantity cm³/ : 86.0...88.0
1000 s: (83.5...90.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.30
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.90...6.10
Del.quantity cm³/ : 12.5...16.5
1000 s: (10.5...18.5)
Spread cm³ : 2.50
1000 s: (4.50)

Remarks:
: VALMET

APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 g 4
 Edition : 03.07.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 085 317
 Injection pump
 Pump designation : PES6A95D410RS2772
 EP type number : 9 400 084 018
 Governor
 Governor design. : RQV300...1300AB1066-
 6L
 Governor no. : 9 420 080 265

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM 366 A

1st version kW : 125.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 006

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 11

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.40...10.50

Del.quantity cm3/ : 8.9...9.1

100 s: (8.7...9.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.9...7.1

Del.quantity cm3/ : 0.8...1.4
 100 s: (0.6...1.6)

Spread cm3 : 0.3
 100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 0.80...1.30

2nd speed rpm : 500
 travel mm : 2.30...2.80

3rd speed rpm : 750
 travel mm : 4.10...4.30

4th speed rpm : 1500
 travel mm : 8.50...8.60

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1

Speed rpm : 1500

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 89.0...91.0
 1000 : (87.0...93.0)

Spread cm3 : 3.50
 1000 : (6.00)

RATED SPEED

1st version

Control Lever

position degrees: 105...113

Testing:

1st rack travel in: 9.40

Speed rpm : 1340...1350

2nd rack travel in: 4.00

Speed rpm : 1460...1490

4th rack travel in: 1630

Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever

position degrees: 62...70

Testing:

Speed rpm : 100

Minimum rack travel: 8.00

Speed rpm : 300

Rack travel in mm : 6.90...7.10

CONSTANT REGULATION

Speed rpm : 420...550

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1300

Rack travel in m: 10.40...10.50

2nd speed rpm : 800

Rack travel in m: 10.90...11.00

4th speed rpm : 1000

Rack travel in m: 10.60...10.80

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 700

Rack travel mm : 10.90...11.00

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 9.50...9.70

2nd pressure hPa : 450

Rack travel in m: 10.50...10.60

3rd pressure hPa : 300

Rack travel in m: 9.80...10.00

START CUT-OUT

Speed 1/min : 220 (240)

A27

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 800

Del.quantity cm³/ : 86.0...89.0

1000 s: (83.5...91.5)

Speed rpm : 1000

Del.quantity cm³/ : 88.0...91.0

1000 s: (85.5...93.5)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm³/ : 59.0...61.0

1000 s: (57.0...63.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack travel: 9.40

Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm³/ : 95.0...115.0

1000 s: (-)

Rack travel in mm : 14.50...14.70

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 5,8 c
 Edition : 03.07.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 085 319
 Injection pump
 Pump designation : PES6A95D410RS2772
 EP type number : 9 400 084 018
 Governor
 Governor design. : RQV300...1400AB1066-10L
 Governor no. : 9 420 080 287

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM 352 A

1st version kW : 141.0
 Rated speed : 2800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 006

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 9.50...9.60

Del.quantity cm3/ : 7.7...7.9

100 s: (7.5...8.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.9...7.1

Del.quantity cm3/ : 0.8...1.4

100 s: (0.6...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.80...1.30

2nd speed rpm : 500

travel mm : 2.30...2.80

3rd speed rpm : 750

travel mm : 4.10...4.30

4th speed rpm : 1500

travel mm : 8.50...8.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1500

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Aneroid pressure h: 700

Del.quantity : 77.5...79.5

1000 : (75.5...81.5)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 106...114

Testing:

1st rack travel in: 8.50

Speed rpm : 1440...1450

2nd rack travel in: 4.00

Speed rpm : 1520...1550

4th rack travel in: 1650

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 63...71

Testing:

Speed rpm : 100

Minimum rack travel: 8.00

Speed rpm : 300

Rack travel in mm : 6.90...7.10

CONSTANT REGULATION

Speed rpm : 420...550

TORQUE CONTROL

Dimension a mm : 0.50

Torque control curve - 1st version

1st speed rpm : 1400

Rack travel in m: 9.50...9.60

2nd speed rpm : 800

Rack travel in m: 10.00...10.10

4th speed rpm : 1000

Rack travel in m: 9.70...9.90

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 700

Rack travel mm : 10.00...10.10

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 8.20...8.50

2nd pressure hPa : 330

Rack travel in m: 9.70...9.80

3rd pressure hPa : 170

Rack travel in m: 9.00...9.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 800

Del.quantity cm³/ : 74.0...77.0

1000 s: (71.5...79.5)

Aneroid pressure h: 700

Speed rpm : 1000

Del.quantity cm³/ : 77.5...80.5

1000 s: (75.0...83.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm³/ : 41.0...43.0

1000 s: (39.0...45.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.50

Speed rpm : 1440...1450

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm³/ : 70.0...90.0

1000 s: (67.0...93.0)

Rack travel in mm : 12.90...13.10

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FOR 7,8 h
 Edition : 03.07.90
 Replaces : 24.11.89
 Test oil : ISO-4113
 Combination no. : 9 400 087 416
 Injection pump
 Pump designation : PES6P110A720RS3226
 EP type number : 9 400 087 066
 Governor
 Governor design. : RQV350...1000PA863-8
 Governor no. : 9 420 080 271

Customer spec. information
 Customer : FORD (FNH)

Engine : 7,8 L TC

1st version kW : 160.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 9 401 087 403

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 017

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test Lines : 1 468 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.55...4.65
 : (4.50...4.70)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.70...12.80

Del.quantity cm3/ : 13.8...14.0

100 s: (13.6...14.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 6.9...7.1

Del.quantity cm3/ : 2.7...3.1

100 s: (2.5...3.4)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1200

travel mm : 9.30...9.70

2nd speed rpm : 1000

travel mm : 6.90...7.10

3rd speed rpm : 500

travel mm : 2.20...3.00

4th speed rpm : 350

travel mm : 1.40...1.70

5th speed rpm : 250

travel mm : 0.50...1.10

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1220

Rack travel in mm : 7.00...9.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 900

Del.quantity : 138.0...140.0
1000 : (136.0...142.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 105...113

Testing:
1st rack travel in: 11.70
Speed rpm : 1055...1065
2nd rack travel in: 4.00
Speed rpm : 1145...1175
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 74...82

Testing:
Speed rpm : 100
Minimum rack travel: 12.00
Speed rpm : 350
Rack travel in mm : 6.90...7.10

CONSTANT REGULATION
Speed rpm : 390...460

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 12.70...12.80
2nd speed rpm : 700
Rack travel in m: 14.00...14.10
3rd speed rpm : 850
Rack travel in m: 13.30...13.50

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 14.00...14.10

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.60...10.90
2nd pressure hPa : 405
Rack travel in m: 11.30...11.40
3rd pressure hPa : 695
Rack travel in m: 13.00...13.30

START CUT-OUT

Speed 1/min : 290 (310)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 700
Del.quantity cm3/ : 153.0...157.0
1000 s: (151.0...155.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 84.0...86.0
1000 s: (82.0...88.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.70
Speed rpm : 1055...1065

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 135.0...155.0
1000 s: (130.0...160.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.90...7.10
Del.quantity cm3/ : 27.5...31.5
1000 s: (25.0...34.0)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

Delivery-valve spring pre-tension
3.0...3.2 mm.

Set shutoff stop 1.5...2.0 mm before
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FOR 7,8 i 1
 Edition : 03.07.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 087 417
 Injection pump
 Pump designation : PES6P120A720RS3234
 EP type number : 9 400 087 068
 Governor
 Governor design. : RQV350...1150PA923K
 Governor no. : 9 420 080 272

Customer spec. information
 Customer : FORD (FNH)

Engine : 7.8 Ltr

1st version kW : 141.7
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 2 417 413 072

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 70...80

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.35...2.45
 : (2.30...2.50)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150
 Rack travel in mm : 12.20...12.30
 Del.quantity cm3/ : 14.4...14.6
 100 s: (14.1...14.9)
 Spread cm3 : 0.5
 100 s: (0.9)

2nd speed rpm : 350.0
 Rack travel in mm : 5.4...5.6
 Del.quantity cm3/ : 2.6...3.2
 100 s: (2.4...3.4)
 Spread cm3 : 0.5
 100 s: (0.8)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1200
 travel mm : 9.50...9.70
 2nd speed rpm : 1000
 travel mm : 7.80...8.00
 3rd speed rpm : 800
 travel mm : 6.40...6.80
 4th speed rpm : 450
 travel mm : 3.50...3.70
 5th speed rpm : 350
 travel mm : 2.00...2.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1150
 Aneroid pressure h: 900
 Del.quantity : 144.5...146.5
 1000 : (141.5...149.5)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 60...68

Testing:
1st rack travel in: 11.20
Speed rpm : 1210...1220
2nd rack travel in: 4.00
Speed rpm : 1315...1345
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 10...18

Testing:
Speed rpm : 275
Minimum rack travel: 7.20
Speed rpm : 350
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION
Speed rpm : 390...460

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 12.20...12.30
2nd speed rpm : 750
Rack travel in m: 11.10...11.30
3rd speed rpm : 650
Rack travel in m: 10.60...11.00

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 1150
Pressure hPa : 900
Rack travel mm : 12.20...12.30

Measurement
Speed 1/min : 1150

1st pressure hPa : -
Rack travel in m: 8.40...8.80
2nd pressure hPa : 290
Rack travel in m: 9.50...9.60
3rd pressure hPa : 440
Rack travel in m: 11.10...11.50

START CUT-OUT

Speed 1/min : 290 (310)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 750
Del.quantity cm³/ : 151.0...157.0
1000 s: (148.0...160.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 116.0...120.0
1000 s: (114.0...122.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack travel: 11.20
Speed rpm : 1210...1220

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...175.0
1000 s: (131.0...179.0)
Rack travel in mm : 10.70...11.50

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ : 26.5...32.5
1000 s: (24.5...34.5)
Spread cm³ : 5.00
1000 s: (8.00)

Remarks:

Set shutoff stop 1.5...2.0 mm before shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FOR 7,8 i
 Edition : 03.07.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 087 419
 Injection pump
 Pump designation : PES6P120A720RS3234
 EP type number : 9 400 087 068
 Governor
 Governor design. : RQV350...1150PA923-2
 K
 Governor no. : 9 420 080 274

Customer-spec. information
 Customer : FORD (FNH)

Engine : 7.8 Ltr

1st version kW : 156.6
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 072

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 85...95

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.35...2.45
 : (2.30...2.50)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 12.50...12.60

Del.quantity cm³/ : 14.6...14.8

100 s: (14.3...15.1)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del.quantity cm³/ : 2.6...3.2

100 s: (2.4...3.4)

Spread cm³ : 0.5

100 s: (0.8)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1200

travel mm : 9.50...9.70

2nd speed rpm : 1000

travel mm : 7.80...8.00

3rd speed rpm : 800

travel mm : 6.40...6.80

4th speed rpm : 450

travel mm : 3.50...3.70

5th speed rpm : 350

travel mm : 2.00...2.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 900

Del.quantity : 146.5...148.5

1000 : (143.5...151.5)

Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
 position degrees: 63...71

Testing:
1st rack travel in: 11.50
 Speed rpm : 1210...1220
2nd rack travel in: 4.00
 Speed rpm : 1305...1335
4th rack travel in: 1400
 Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
 position degrees: 10...18

Testing:
Speed rpm : 275
Minimum rack travel: 7.20
Speed rpm : 350
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION
Speed rpm : 390...460

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1150
 Rack travel in m: 12.50...12.60
2nd speed rpm : 750
 Rack travel in m: 11.80...12.00
3rd speed rpm : 650
 Rack travel in m: 11.20...11.60

Aneroid/Altitude
 Compensator Test

1st version
Setting
Speed rpm : 1150
Pressure hPa : 900
Rack travel mm : 12.50...12.60

Measurement
Speed 1/min : 1150

1st pressure hPa : -
 Rack travel in m: 8.20...8.60
2nd pressure hPa : 345
 Rack travel in m: 9.40...9.50
3rd pressure hPa : 520
 Rack travel in m: 11.30...11.70

START CUT-OUT

B07

Speed 1/min : 290 (310)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 750
Del.quantity cm³/ : 160.0...166.0
 1000 s: (157.0...169.0)
Spread cm³ : 8.00
 1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 106.5...110.5
 1000 s: (104.5...112.5)

BREAKAWAY

1st version
1mm rack travel less than

 full load rack travel: 11.50
Speed rpm : 1210...1220

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 145.0...185.0
 1000 s: (141.0...189.0)
Rack travel in mm : 11.20...12.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ : 26.5...32.5
 1000 s: (24.5...34.5)
Spread cm³ : 5.00
 1000 s: (8.00)

Remarks:

Set shutoff stop 1.5...2.0 mm before shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FOR 7,8 i 2
 Edition : 03.07.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 087 420
 Injection pump
 Pump designation : PES6P120A720RS3234
 EP type number : 9 400 087 068
 Governor
 Governor design. : RQV350...1150PA923-3
 K
 Governor no. : 9 420 080 275

Customer-spec. information
 Customer : FORD (FNH)

Engine : 7.8 Ltr

1st version kW : 167.8
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 072

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 70...80

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.35...2.45
 : (2.30...3.50)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 13.40...13.50

Del.quantity cm³/ : 15.8...16.0

100 s: (15.5...16.3)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del.quantity cm³/ : 2.6...3.2

100 s: (2.4...3.4)

Spread cm³ : 0.5

100 s: (0.8)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1200

travel mm : 9.50...9.70

2nd speed rpm : 1000

travel mm : 7.80...8.00

3rd speed rpm : 800

travel mm : 6.40...6.80

4th speed rpm : 450

travel mm : 3.50...3.70

5th speed rpm : 350

travel mm : 2.00...2.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 900

Del.quantity : 158.5...160.5

1000 : (155.5...163.5)

Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 62...70

Testing:
1st rack travel in: 12.40
Speed rpm : 1210...1220
2nd rack travel in: 4.00
Speed rpm : 1335...1365
4th rack travel in: 1450
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 10...18

Testing:
Speed rpm : 275
Minimum rack travel: 7.20
Speed rpm : 350
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION
Speed rpm : 390...460

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 13.40...13.50
2nd speed rpm : 750
Rack travel in m: 11.90...12.10
3rd speed rpm : 650
Rack travel in m: 11.40...11.80

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 1150
Pressure hPa : 900
Rack travel mm : 13.40...13.50

Measurement
Speed 1/min : 1150

1st pressure hPa : -
Rack travel in m: 8.30...8.70
2nd pressure hPa : 320
Rack travel in m: 9.70...9.80
3rd pressure hPa : 525
Rack travel in m: 11.90...12.30

START CUT-OUT

Speed 1/min : 290 (310)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 750
Del.quantity cm³/ : 161.5...167.5
 1000 s: (158.5...170.5)
Spread cm³ : 8.00
 1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 108.5...112.5
 1000 s: (106.5...114.5)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.40
Speed rpm : 1210...1220

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...180.0
 1000 s: (138.0...182.0)
Rack travel in mm : 11.10...11.90

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ : 26.5...32.5
 1000 s: (24.5...34.5)
Spread cm³ : 5.00
 1000 s: (8.00)

Remarks:

Set shutoff stop 1.5...2.0 mm before
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FOR 6,6 n
Edition : 03.07.90
Replaces : -
Test oil : ISO-4113
Combination no. : 9 400 087 421
Injection pump
Pump designation : PES6P100A720RS3235
EP type number : 9 400 087 067
Governor
Governor design. : RQV350...1300PA923-4
K
Governor no. : 9 420 080 276

Customer-spec. information
Customer : FORD (FNH)

Engine : 6.6 Ltr

1st version kW : 125.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 072

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 85...95

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.45...3.55
: (3.40...3.60)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.90...15.00

Del.quantity cm3/ : 14.4...14.6

100 s: (14.1...14.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 6.5...6.7

Del.quantity cm3/ : 1.4...2.0

100 s: (1.2...2.2)

Spread cm3 : 0.5

100 s: (0.8)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1300

travel mm : 9.20...9.40

2nd speed rpm : 600

travel mm : 4.80...5.10

3rd speed rpm : 450

travel mm : 3.60...3.90

4th speed rpm : 350

travel mm : 2.00...2.20

5th speed rpm : 275

travel mm : 0.70...1.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1200

Del.quantity : 144.0...146.0

1000 : (141.0...149.0)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 62...70

Testing:
1st rack travel in: 14.00
Speed rpm : 1360...1370
2nd rack travel in: 4.00
Speed rpm : 1500...1530
4th rack travel in: 1600
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 13...21

Testing:
Speed rpm : 275
Minimum rack travel: 8.50
Speed rpm : 350
Rack travel in mm : 6.50...6.70

CONSTANT REGULATION
Speed rpm : 390...460

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1300
Rack travel in m: 14.90...15.00
2nd speed rpm : 850
Rack travel in m: 12.80...13.00
3rd speed rpm : 550
Rack travel in m: 11.50...11.90

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 1300
Pressure hPa : 1200
Rack travel mm : 14.90...15.00

Measurement
Speed 1/min : 1300

1st pressure hPa : -
Rack travel in m: 9.30...9.70
2nd pressure hPa : 375
Rack travel in m: 10.90...11.00
3rd pressure hPa : 715
Rack travel in m: 13.50...13.90

START CUT-OUT

Speed 1/min : 290 (310)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 850
Del.quantity cm³/ : 132.0...138.0
1000 s: (129.0...141.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 86.0...90.0
1000 s: (84.0...92.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 14.00
Speed rpm : 1360...1370

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...180.0
1000 s: (138.0...182.0)
Rack travel in mm : 13.10...13.90

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.50...6.70
Del.quantity cm³/ : 14.0...20.0
1000 s: (12.0...22.0)
Spread cm³ : 5.00
1000 s: (8.00)

Remarks:

Set shutoff stop 1.5...2.0 mm before shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FOR 7,8 j
 Edition : 03.07.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 087 426
 Injection pump
 Pump designation : PES6P110A72ORS3259
 EP type number : 9 400 087 069
 Governor
 Governor design. : RSV650...1250P8A530-
 2
 Governor no. : 9 420 082 327

Customer-spec. information
 Customer : FORD (FNH)

Engine : 7.8 l

1st version kW : 190.0
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 017

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 4.25...4.35
 : (4.20...4.40)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 2.00...3.00

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 16.2...16.4

100 s: (16.0...16.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 650.0

Rack travel in mm : 6.5...6.7

Del.quantity cm3/ : 2.2...2.6

100 s: (2.0...2.9)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 3.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 1000

Del.quantity : 162.0...164.0

1000 : (160.0...166.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 98...106

Testing:

1st rack travel in: 11.10
Speed rpm : 1260...1270
2nd rack travel in: 4.00
Speed rpm : 1295...1315
3rd rack travel in: 4.00
Speed rpm : 1310...1330
4th rack travel in: 1400
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 73...81
Setting point w/out bumper spring
Speed rpm : 650
Rack travel in mm : 6.1
Speed rpm : 650
Rack travel in mm : 6.50...6.70
Rack travel in mm : 2.00
Speed rpm : 690...750

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 1200
Pressure hPa : 1000
Rack travel mm : 12.10...12.20

Measurement

Speed 1/min : 1200

1st pressure hPa : -
Rack travel in m: 9.20...9.30
2nd pressure hPa : 400
Rack travel in m: 9.70...9.80
3rd pressure hPa : 600
Rack travel in m: 11.40...11.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 67.5...69.5
1000 s: (65.5...71.5)

BREAKAWAY

1st version

B13

1mm rack travel less than

full load rack tr: 11.10
Speed rpm : 1260...1270

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 140.0...170.0
1000 s: (136.0...174.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 650
Rack travel in mm : 6.50...6.70
Del.quantity cm3/ : 22.5...26.5
1000 s: (20.0...29.0)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

APPLICATION

Combine-harvester

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,9 i 1
 Edition : 03.07.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 9 400 087 429
 Injection pump
 Pump designation : PES6P120A720RS3256
 EP type number : 9 400 087 071
 Governor
 Governor design. : RQV300...1300PA963
 Governor no. : 9 420 080 283

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM 366 LA

1st version kW : 154.5
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40
 : (4.25...4.45)
 Rack travel in mm : 9.00...12.00
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.20...12.30

Del.quantity cm³/ : 15.0...15.2

100 s: (14.7...15.5)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 8.8...9.2

Del.quantity cm³/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.10...1.70

2nd speed rpm : 650

travel mm : 3.70...4.30

3rd speed rpm : 1060

travel mm : 5.60...6.10

4th speed rpm : 1460

travel mm : 9.70...10.20

5th speed rpm : 1360

travel mm : 8.20...8.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 1400

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1300
Aneroid pressure h: 900
Del.quantity : 150.0...152.0
1000 : (147.9...155.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 107...115

Testing:
1st rack travel in: 11.20
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1410...1440

LOW IDLE 1
Control lever
position degrees: 78...86

Testing:
Speed rpm : 200
Minimum rack travel: 10.70
Speed rpm : 300
Rack travel in mm : 8.80...9.20

CONSTANT REGULATION
Speed rpm : 300...450

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : -
Rack travel mm : 9.80...10.00

Measurement
Speed 1/min : 600

1st pressure hPa : 400
Rack travel in m: 10.50...10.70
2nd pressure hPa : 600
Rack travel in m: 11.70...11.90

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900

Speed rpm : 700
Del.quantity cm3/ : 118.0...122.0
1000 s: (115.0...125.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 46.0...48.0
1000 s: (43.0...51.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.20
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 80.0...100.0
1000 s: (76.0...104.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 i
Edition : 03.07.90
Replaces : -
Test oil : ISO-4113

Combination no. : 9 400 087 430

Injection pump
Pump designation : PES6P120A720RS3256
EP type number : 9 400 087 071
Governor
Governor design. : RQV300...1300PA963-1
Governor no. : 9 420 080 284

Customer-spec. information
Customer : MERCEDES-BENZ

Engine : OM 366 LA

1st version kW : 169.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 1 417 413 025

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 100...120

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40
: (4.25...4.45)
Rack travel in mm : 9.00...12.00
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.10...13.20

Del.quantity cm³/ : 16.5...16.7

100 s: (16.2...17.0)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 8.8...9.2

Del.quantity cm³/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
travel mm : 1.10...1.70

2nd speed rpm : 650
travel mm : 3.70...4.30

3rd speed rpm : 1060
travel mm : 5.60...6.10

4th speed rpm : 1460
travel mm : 9.70...10.20

5th speed rpm : 1360
travel mm : 8.20...8.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 1400

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1300
Aneroid pressure h: 900
Del.quantity : 165.0...167.0
1000 : (162.0...170.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 108...116

Testing:
1st rack travel in: 12.20
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1420...1450

LOW IDLE 1
Control lever
position degrees: 78...86

Testing:
Speed rpm : 200
Minimum rack travel: 10.70
Speed rpm : 300
Rack travel in mm : 8.80...9.20

CONSTANT REGULATION
Speed rpm : 300...450

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : -
Rack travel mm : 10.30...10.50

Measurement
Speed 1/min : 600

1st pressure hPa : 400
Rack travel in m: 11.00...11.20
2nd pressure hPa : 600
Rack travel in m: 12.20...12.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900

Speed rpm : 700
Del.quantity cm3/ : 146.0...150.0
1000 s: (143.0...153.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 56.0...58.0
1000 s: (53.0...61.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.20
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 80.0...100.0
1000 s: (76.0...104.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 b
 Edition : 26.03.90
 Replaces : 1.9.88
 Test oil : ISO-4113
 Combination no. : 9 400 230 103
 Injection pump
 Pump designation : PES6A100D320/3RS2691
 -2
 EP type number : 9 410 230 028
 Governor
 Governor design. : RQV350...1100AB1227R
 Governor no. : 9 420 231 015

Customer-spec. information
 Customer : CUMMINS

Engine : 6 CT 8.3

1st version kW : 156.6
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 017

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.60...12.70

Del.quantity cm3/ : 12.6...12.8

100 s: (12.4...13.0)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.8...2.2
 100 s: (1.5...2.4)

Spread cm3 : 0.6

100 s: (0.8)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1100
 travel mm : 7.70...7.80

2nd speed rpm : 1150
 travel mm : 8.00...8.60

3rd speed rpm : 1290
 travel mm : 9.50...10.10

4th speed rpm : 350
 travel mm : 1.20...1.60

5th speed rpm : 600
 travel mm : 3.90...4.50

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1100
 Aneroid pressure h: 900

Del.quantity : 126.5...128.5
1000 : (124.5...130.5)
Spread cm3 : 4.00
1000 : (6.50)

RATED SPEED

1st version
Control lever
position degrees: 57...65

Testing:

1st rack travel in: 11.60
Speed rpm : 1145...1155
2nd rack travel in: 4.00
Speed rpm : 1260...1290
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 9...17
Speed rpm : 350
Rack travel in mm : 5.40...5.60

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 12.60...12.70

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.10...10.30
2nd pressure hPa : 405
Rack travel in m: 10.90...11.00
3rd pressure hPa : 535
Rack travel in m: 11.80...12.20

START CUT-OUT

Speed 1/min : 260 (280)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 79.0...83.0
1000 s: (77.0...85.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.60
Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 165.0...185.0
1000 s: (160.0...190.0)
Rack travel in mm : 15.30...15.70

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.40...5.60
Del.quantity cm3/ : 18.0...22.0
1000 s: (15.5...24.5)
Spread cm3 : 6.00
1000 s: (8.00)

Remarks:

Set shutoff solenoid 0.5...1.5 mm
before shutoff.

Start-of-delivery mark is at 7° after
start of delivery.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6, D D 83
 Edition : 17.05.90
 Replaces : 16.02.90
 Test oil : ISO-4113
 Combination no. : 0 403 446 246
 Injection pump
 Pump designation : PES6MW100/720RS1144
 EP type number : 0 413 406 138
 Governor
 Governor design. : RQV300...1300MW50-6
 Governor no. : 0 420 083 209

Customer spec. information
 Customer : MB-NFZ

Engine : OM366A

1st version kW : 125.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.00...11.10

Del.quantity cm3/ : 7.7...7.9

100 s: (7.5...8.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 8.0...8.2

Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1430

travel mm : 9.30...9.70

2nd speed rpm : 1340

travel mm : 8.50...8.70

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1300

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 800

Del.quantity : 77.0...79.0

1000 : (75.0...81.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 108...116

Testing:

1st rack travel in: 10.00
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1425...1455
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 78...86
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 8.1

Testing:

Speed rpm : 100
Minimum rack travel: 9.20
Speed rpm : 300
Rack travel in mm : 8.00...8.20

TORQUE CONTROL

Dimension a mm : 1.20
Torque control curve - 1st version
1st speed rpm : 1300
Rack travel in m: 10.90...11.00
2nd speed rpm : 800
Rack travel in m: 11.80...12.00
3rd speed rpm : 585
Rack travel in m: 12.00...12.20
4th speed rpm : 1100
Rack travel in m: 11.10...11.30

Aneroid/Altitude
Compensator Test

1st version

Pressure hPa : -
Rack travel mm : 10.50...10.60

1st pressure hPa : 180
Rack travel in m: 10.90...11.00
2nd pressure hPa : 290
Rack travel in m: 11.70...12.00
3rd pressure hPa : 800
Rack travel in m: 12.00...12.20

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

B21

Aneroid pressure h: 800
Speed rpm : 800
Del.quantity cm3/ : 76.0...78.0
1000 s: (74.0...80.0)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: 800
Speed rpm : 585
Del.quantity cm3/ : 68.5...71.5
1000 s: (66.0...74.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 39.0...41.0
1000 s: (37.0...43.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.00
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 78.0...88.0
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 8.00...8.20
Del.quantity cm3/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P20
Edition : 21.06.90
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 4/12F1250 R359
Type number : 0 460 424 054

Customer-specific information
Customer : CUM

Engine : 4BTA

TEST BENCH REQUIREMENTS

Calibrating oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 0.35

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery block
Piston stroke mm : 1.25
mm : $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 2.0...2.4

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 5.1...6.1

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 83.0...84.0
Dispersion cm³ : 4.0
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 53.0...54.0

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm³/
1000H.: 10.0...12.0
Dispersion cm³ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1330
Charge press. hPa: 1000
Del.quantity cm³/
1000H: 68.0...74.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 80.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400
TD travel mm: 2.9...3.9
mm: (2.9...3.9)

2nd speed 1/min: 1000
Charge press. hPa: 1000
TD travel mm: 0.9...1.7
mm: (0.6...2.0)

3rd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 2.0...2.4
mm: (1.5...2.9)

4th speed 1/min: 1250
Charge press. hPa: 1000

TD travel mm: 2.8...3.6
 mm: (2.5...3.9)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump
 pressure bar: 2.6...3.2
2nd speed 1/min: 1000
Charge press. hPa: 1000
Supply-pump
 pressure bar: 4.9...5.5
3rd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump
 pressure bar: 5.3...6.2
4th speed 1/min: 1250
Charge press. hPa: 1000
Supply-pump
 pressure bar: 6.0...6.6

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
 quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1000
Overflow : 55...138
 quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting
 point hPa: 535
Del.quantity cm³/: 71.5...72.5
 1000H.: (68.0...76.0)
2nd speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
 1000H.: -
3rd speed 1/min: 1430
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
 1000H.: -
4th speed 1/min: 1330
Charge press. hPa: 1000
Del.quantity cm³/: 68.0...74.0
 1000H.: (65.0...77.0)
5th speed 1/min: 1250
Charge press. hPa: 1000
Del.quantity cm³/: 76.5...79.5
 1000H.: (75.0...81.0)
6th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/: 77.5...80.5
 1000H.: (75.5...82.5)
7th speed 1/min: 850

Charge press. hPa: 1000
Del.quantity cm³/: 83.0...84.0
 1000H.: (80.5...86.5)
8th speed 1/min: 700
Charge press. hPa: 535
Del.quantity cm³/: 71.5...72.5
 1000H.: (68.0...76.0)
9th speed 1/min: 500
Del.quantity cm³/: 53.0...54.0
 1000H.: (49.5...57.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: 0..3
 1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 10...12.0
 1000H.: (6.0...16.0)
2nd speed 1/min: 450
Del.quantity cm³/: 0.0...2.0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
 ind. 1000H: 80.0
2nd speed 1/min: 250
Del.quantity cm³/: -
max. 1000H : 40.0

Shutoff electromagnet:

Cut-in
 min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : 3.7
MS mm : 0.8...1.2
SVS max. mm : 2.1
XK mm : 21.8...23.8
XL mm : 11.3...14.7

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (44)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P22
Edition : 19.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R374
Type number : 0 460 424 057

Customer-specific information
Customer : CUM

Engine : 4BTA 3.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): +0.02(0.04)

Start of delivery block
Piston stroke mm : 1.55
mm : +0.02(0.06)
Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 850
Charge press. hPa: 1000

Setting value mm: 4.0...4.4

Supply-pump pressure:

Speed 1/min: 850
Charge press. hPa: 1000
Setting value bar: 5.6...6.2

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 85.5...86.5
Dispersion cm3/ : 4.0
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 64.5...65.5

Low-idle speed regulation:

Speed 1/min: 365
Del.quantity cm3/
1000H.: 8.0...14.0
Dispersion cm3/ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1310
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 61.0...67.0

Start:

Speed 1/min: 100
mind cm3/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
TD travel mm: 1.8...2.6
mm: (1.5...2.9)

2nd speed 1/min: 850
Charge press. hPa: 1000
TD travel mm: 4.0...4.4
mm: (3.5...4.9)

3rd speed 1/min: 1100
Charge press. hPa: 1000

TD travel mm: 4.9...5.7
mm: (4.6...6.0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 4.0...4.6
2nd speed 1/min: 850
Charge press. hPa: 1000
Supply-pump pressure bar: 5.6...6.2
3rd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump pressure bar: 6.7...7.3

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 350
Del.quantity cm³/: 79.5...81.5
1000H.: (76.0...84.0)
2nd speed 1/min: 1420
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: -
3rd speed 1/min: 1350
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: -
4th speed 1/min: 1310
Charge press. hPa: 1000
Del.quantity cm³/: 61.0...67.0
1000H.: (58.0...70.0)
5th speed 1/min: 1250
Charge press. hPa: 1000
Del.quantity cm³/: 74.5...77.5
1000H.: (73.0...79.0)
6th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/: 77.0...80.0
1000H.: (75.0...82.0)
7th speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm³/: 85.5...86.5
1000H.: (83.0...89.0)
8th speed 1/min: 700

Charge press. hPa: 350
Del.quantity cm³/: 79.5...80.5
1000H.: (76.0...84.0)
9th speed 1/min: 500
Del.quantity cm³/: 63.5...64.5
1000H.: (60.0...68.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 365
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

Mfg. date: until : -
1st speed 1/min: 365
Del.quantity cm³/: 8.0...14.0
1000H.: (6.0...16.0)
2nd speed 1/min: 450
Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
ind. 1000H: 70.0
2nd speed 1/min: 230
max. 1000H : 60.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5.0...5.4
MS	mm	: 1.0...1.4
SVS max.	mm	: 2.4
XK	mm	: 21.8...23.8
XL	mm	: 13.2...16.6

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P21
Edition : 21.06.90
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 4/12F1250 R374
Type number : 0 460 424 057
Customer Part-No. : 3 916 926

Customer-specific information
Customer : CUM

Engine : 4BTA 3.9 IND.

Power k: 88
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.55
mm: $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 850
Charge press. hPa: 1000
Setting value mm: 4.0...4.4

Supply-pump pressure:

Speed 1/min: 850
Charge press. hPa: 1000
Setting value bar: 5.6...6.2

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 85.5...86.5
Dispersion cm³/
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 63.5...64.5

Full-load speed regulation:

Speed 1/min: 1310
Charge press. hPa: 1000
Del.quantity cm³/
1000H: 61.0...67.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
TD travel mm: 1.8...2.6
mm: (1.5...2.9)
2nd speed 1/min: 850
Charge press. hPa: 1000
TD travel mm: 4.0...4.4
mm: (3.5...4.9)
3rd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 4.9...5.7
mm: (4.6...6.0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
 Charge press. hPa: 1000
 Supply-pump pressure bar: 4.0...4.6
 2nd speed 1/min: 850
 Charge press. hPa: 1000
 Supply-pump pressure bar: 5.6...6.2
 3rd speed 1/min: 1100
 Charge press. hPa: 1000
 Supply-pump pressure bar: 6.7...7.3

Overflow quantity at overflow valve:

1st speed 1/min: 500
 Overflow : 41...83
 quantity cm³/10s: (26...98)
 2nd speed 1/min: 1250
 Charge press. hPa: 1000
 Overflow : 55...138
 quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
 Charge-air pressure-setting point hPa: 350
 Del.quantity cm³/: 79.5...80.5
 1000H.: (76.0...84.0)
 2nd speed 1/min: 1420
 Charge press. hPa: 1000
 Del.quantity cm³/: 0.0...3.0
 1000H.: -
 3rd speed 1/min: 1350
 Charge press. hPa: 1000
 Del.quantity cm³/: 15.0...55.0
 1000H.: -
 4th speed 1/min: 1310
 Charge press. hPa: 1000
 Del.quantity cm³/: 61.0...67.0
 1000H.: (58.0...70.0)
 5th speed 1/min: 1250
 Charge press. hPa: 1000
 Del.quantity cm³/: 75.5...76.5
 1000H.: (73.0...79.0)
 6th speed 1/min: 1100
 Charge press. hPa: 1000
 Del.quantity cm³/: 77.0...80.0
 1000H.: (75.0...82.0)
 7th speed 1/min: 850
 Charge press. hPa: 1000
 Del.quantity cm³/: 85.5...86.5
 1000H.: (83.0...89.0)
 8th speed 1/min: 700
 Charge press. hPa: 350
 Del.quantity cm³/: 79.5...81.5
 1000H.: (76.0...84.0)
 9th speed 1/min: 500

Del.quantity cm³/: 63.5...64.5
 1000H.: (60.0...68.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400
 Del.quantity cm³/: 0..3
 1000H.: -

Electr. shutoff:

Speed 1/min: 365
 ELAB volt: -
 Del.quantity cm³/: 0.0...3.0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 365
 Del.quantity cm³/: 8.0...14.0
 1000H.: (6.0...16.0)
 2nd speed 1/min: 450
 Del.quantity cm³/: 0.0...4.0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
 Del.quantity cm³/: -
 ind. 1000H: 70.0

2nd speed 1/min: 230
 Del.quantity cm³/: -
 max. 1000H : 60.0

Shutoff electromagnet:

Cut-in
 min. voltage : 10.0
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
 K mm : -
 KF mm : 5.0...5.4
 MS mm : 1.0...1.4
 SVS max. mm : 2.4
 XK mm : 21.8...23.8
 XL mm : 13.2...16.6

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket



BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P24
Edition : 21.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1150 R378
Type number : 0 460 424 058
Customer Part-No. : 3 717 508

Customer-specific information
Customer : CUM

Engine : 4BT 3.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.8
mm : $\pm 0.02(0.06)$

Outlet : A

Injection pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900

Setting value mm: 2.0...2.4

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4.2...4.8

Full-load del. w/out charge press.:

Speed 1/min : 900
Del.quantity cm3/
1000H.: 67.0...68.0
Dispersion cm3/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8.0...14.0
Dispersion cm3/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1190
Del.quantity cm3/
1000H: 47.0...53.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 1.8...2.6
mm: (0.5...1.9)
2nd speed 1/min: 900
TD travel mm: 2.0...2.4
mm: (1.5...2.9)
3rd speed 1/min: 1150
TD travel mm: 3.2...4.0
mm: (2.9...4.3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.5...3.1
2nd speed 1/min: 900
Supply-pump
pressure bar: 4.2...4.8
3rd speed 1/min: 1150

Supply-pump
pressure bar: 5.2...5.8

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1150
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300
Del.quantity cm³/: 0.0...3.0
1000H.: -
2nd speed 1/min: 1220
Del.quantity cm³/: 15.0...55.0
1000H.: -
3rd speed 1/min: 1190
Del.quantity cm³/: 47.0...53.0
1000H.: (44.0...56.0)
4th speed 1/min: 1150
Del.quantity cm³/: 63.5...66.5
1000H.: (62.0...68.0)
5th speed 1/min: 900
Del.quantity cm³/: 67.0...68.0
1000H.: (64.5...70.5)
6th speed 1/min: 750
Del.quantity cm³/: 69.5...73.5
1000H.: (67.5...75.5)
7th speed 1/min: 500
Del.quantity cm³/: 68.0...76.0
1000H.: (66.0...78.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8.0...14.0
1000H.: (6.0...16.0)
2nd speed 1/min: 500
Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 80.0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H : 80.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5.0...5.4
MS mm : 1.1...1.3
SVS max. mm : 4.0

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P25
Edition : 21.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1150 R378
Type number : 0 460 424 058
Customer Part-No. : 3 917 508

Customer-specific information
Customer : CUM

Engine : 4BT 3.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.8
mm: $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900

C05

Setting value mm: 2.0...2.4

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4.2...4.8

Full-load del. w/out charge press.:

Speed 1/min : 900
Del.quantity cm³/
1000H.: 67.0...68.0
Dispersion cm³/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm³/
1000H.: 8.0...14.0
Dispersion cm³/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1190
Del.quantity cm³/
1000H: 47.0...53.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 1.8...2.6
mm: (0.5...1.9)
2nd speed 1/min: 900
TD travel mm: 2.0...2.4
mm: (1.5...2.9)
3rd speed 1/min: 1150
TD travel mm: 3.2...4.0
mm: (2.9...4.3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.5...3.1
2nd speed 1/min: 900
Supply-pump
pressure bar: 4.2...4.8
3rd speed 1/min: 1150

Supply-pump
pressure bar: 5.2...5.8

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1150
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300
Del.quantity cm³/: 0.0...3.0
1000H.: -
2nd speed 1/min: 1220
Del.quantity cm³/: 15.0...55.0
1000H.: -
3rd speed 1/min: 1190
Del.quantity cm³/: 47.0...53.0
1000H.: (44.0...56.0)
4th speed 1/min: 1150
Del.quantity cm³/: 63.5...66.5
1000H.: (62.0...68.0)
5th speed 1/min: 900
Del.quantity cm³/: 67.0...68.0
1000H.: (64.5...70.5)
6th speed 1/min: 750
Del.quantity cm³/: 69.5...73.5
1000H.: (67.5...75.5)
7th speed 1/min: 500
Del.quantity cm³/: 68.0...76.0
1000H.: (66.0...78.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8.0...14.0
1000H.: (6.0...16.0)
2nd speed 1/min: 500
Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 80.0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H : 80.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5.0...5.4
MS	mm	:	1.1...1.3
SVS max.	mm	:	4.0

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P26
Edition : 21.06.90
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 4/12F1000 R378-1
Type number : 0 460 424 059

Customer-specific information
Customer : CUM

Engine : 4BTA 3.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.8
mm: $\pm 0.02(0.06)$
Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 2.4...2.8

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4.0...4.6

Full-load del. w/out charge press.:

Speed 1/min : 900
Del.quantity cm³/
1000H.: 67.5...68.5
Dispersion cm³/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 350
Del.quantity cm³/
1000H.: 3.0...9.0
Dispersion cm³/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1060
Del.quantity cm³/
1000H: 50.5...56.5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 1.3...2.1
mm: (1.0...2.4)
2nd speed 1/min: 900
TD travel mm: 2.4...2.8
mm: (1.9...3.3)
3rd speed 1/min: 1000
TD travel mm: 2.7...3.5
mm: (2.4...3.8)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.2...2.8
Timing valve volt: 900
Supply-pump
pressure bar: 4.0...4.6
3rd speed 1/min: 1000

Supply-pump
pressure bar: 4.4...5.0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200
Del.quantity cm³/: 0.0...3.0
1000H.: -
2nd speed 1/min: 1100
Del.quantity cm³/: 15.0...55.0
1000H.: -
3rd speed 1/min: 1060
Del.quantity cm³/: 50.5...56.5
1000H.: (47.5...59.5)
4th speed 1/min: 1000
Del.quantity cm³/: 65.5...68.5
1000H.: (64.0...70.0)
5th speed 1/min: 900
Del.quantity cm³/: 67.5...68.5
1000H.: (65.0...71.0)
6th speed 1/min: 750
Del.quantity cm³/: 70.0...74.0
1000H.: (68.0...76.0)
7th speed 1/min: 500
Del.quantity cm³/: 70.0...78.0
1000H.: (68.0...80.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1000
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 350
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

Mfg. date: until : 350
Del.quantity cm³/: 3.0...9.0
1000H.: (1.0...11.0)
2nd speed 1/min: 500
Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 90.0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H.: 90.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5.0...5.4
MS	mm	:	1.1...1.5
SVS max.	mm	:	3.0

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P28
Edition : 21.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 RV378-2
Type number : 0 460 424 G60
Customer Part-No. : 3 917 030

Customer-specific information
Customer : CUM

Engine : 4BT 3.9 IND.

Power k: 63
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.8
mm: $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 2.0...2.4

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4.6...5.2

Full-load del. w/out charge press.:

Speed 1/min : 1100
Del.quantity cm3/
1000H.: 68.5...69.5
Dispersion cm3/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 335
Del.quantity cm3/
1000H.: 8.0...14.0
Dispersion cm3/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1290
Del.quantity cm3/
1000H: 58.0...64.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 70.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 0.8...1.6
mm: (0.5...1.9)
2nd speed 1/min: 900
TD travel mm: 2.0...2.4
mm: (1.5...2.9)
3rd speed 1/min: 1100
TD travel mm: 2.9...3.7
mm: (2.6...4.0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.7...3.3
2nd speed 1/min: 750

Supply-pump
pressure bar: 3.9...4.5
3rd speed 1/min: 900
Supply-pump
pressure bar: 4.6...5.2
4th speed 1/min: 1100
Supply-pump
pressure bar: 5.4...6.0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1250
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1450
Del.quantity cm3/: 0.0...3.0
1000H.: -
2nd speed 1/min: 1360
Del.quantity cm3/: 15.0...55.0
1000H.: -
3rd speed 1/min: 1290
Del.quantity cm3/: 58.0...64.0
1000H.: (55.0...67.0)
4th speed 1/min: 1250
Del.quantity cm3/: 66.5...69.5
1000H.: (65.0...71.0)
5th speed 1/min: 1100
Del.quantity cm3/: 68.5...69.5
1000H.: (66.0...72.0)
6th speed 1/min: 750
Del.quantity cm3/: 73.0...77.0
1000H.: (71.0...79.0)
7th speed 1/min: 500
Del.quantity cm3/: 74.0...82.0
1000H.: (72.0...84.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm3/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 335
ELAB volt: -
Del.quantity cm3/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 335

Del.quantity cm3/: 8.0...14.0
1000H.: (6.0...16.0)
2nd speed 1/min: 500
Del.quantity cm3/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm3/: -
ind. 1000H: 75.0

2nd speed 1/min: 300
Del.quantity cm3/: -
max. 1000H : 80.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5.0...5.4
MS mm : 0.8...1.2
SVS max. mm : 4.8

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P27
Edition : 21.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 RV378-2
Type number : 0 460 424 060
Customer Part-No. : 3 917 511

Customer-specific information
Customer : CUM

Engine : 4BT 3.9 IND.

Power k: 74
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.8
mm: $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 2.0...2.4

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4.6...5.2

Full-load del. w/out charge press.:

Speed 1/min : 1100
Del.quantity cm3/
1000H.: 68.5...69.5
Dispersion cm3/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 335
Del.quantity cm3/
1000H.: 8.0...14.0
Dispersion cm3/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1290
Del.quantity cm3/
1000H: 58.0...64.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 70.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 0.8...1.6
mm: (0.5...1.9)
2nd speed 1/min: 900
TD travel mm: 2.0...2.4
mm: (1.5...2.9)
3rd speed 1/min: 1100
TD travel mm: 2.9...3.7
mm: (2.6...4.0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.7...3.3
2nd speed 1/min: 750

Supply-pump
pressure bar: 3.9...4.5
3rd speed 1/min: 900
Supply-pump
pressure bar: 4.6...5.2
4th speed 1/min: 1100
Supply-pump
pressure bar: 5.4...6.0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1250
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1450
Del.quantity cm3/: 0.0...3.0
1000H.: -
2nd speed 1/min: 1360
Del.quantity cm3/: 15.0...55.0
1000H.: -
3rd speed 1/min: 1290
Del.quantity cm3/: 58.0...64.0
1000H.: (55.0...67.0)
4th speed 1/min: 1250
Del.quantity cm3/: 66.5...69.5
1000H.: (65.0...71.0)
5th speed 1/min: 1100
Del.quantity cm3/: 68.5...69.5
1000H.: (66.0...72.0)
6th speed 1/min: 750
Del.quantity cm3/: 73.0...77.0
1000H.: (71.0...79.0)
7th speed 1/min: 500
Del.quantity cm3/: 74.0...82.0
1000H.: (72.0...84.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm3/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 335
ELAB volt: -
Del.quantity cm3/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 335

Del.quantity cm3/: 8.0...14.0
1000H.: (6.0...16.0)
2nd speed 1/min: 500
Del.quantity cm3/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm3/: -
ind. 1000H: 75.0

2nd speed 1/min: 300
Del.quantity cm3/: -
max. 1000H : 80.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5.0...5.4
MS mm : 0.8...1.2
SVS max. mm : 4.8

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P29
Edition : 22.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1050 R378-3
Type number : 0 460 424 061
Customer Part-No. : 3 916 927

Customer-specific information
Customer : CUM

Engine : 4BT 390 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.8
mm : $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900

Setting value mm: 2.3...2.7

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4.1...4.7

Full-load del. w/out charge press.:

Speed 1/min : 900
Del.quantity cm³/
1000H.: 69.0...70.0
Dispersion cm³/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm³/
1000H.: 10.0...12.0
Dispersion cm³/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1110
Del.quantity cm³/
1000H.: 49.0...55.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 1.3...2.1
mm: (1.0...2.4)
2nd speed 1/min: 900
TD travel mm: 2.3...2.7
mm: (1.8...3.2)
3rd speed 1/min: 1050
TD travel mm: 2.8...3.6
mm: (2.5...3.9)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.3...2.9
2nd speed 1/min: 900
Supply-pump
pressure bar: 4.1...4.7
3rd speed 1/min: 1050

Supply-pump
pressure bar: 4.8...5.4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1050
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200
Del.quantity cm³/: 0.0...3.0
1000H.: -
2nd speed 1/min: 1140
Del.quantity cm³/: 15.0...55.0
1000H.: -
3rd speed 1/min: 1110
Del.quantity cm³/: 49.0...55.0
1000H.: (46.0...58.0)
4th speed 1/min: 1050
Del.quantity cm³/: 66.0...69.0
1000H.: (64.5...70.5)
5th speed 1/min: 900
Del.quantity cm³/: 69.0...70.0
1000H.: (66.5...72.5)
6th speed 1/min: 750
Del.quantity cm³/: 72.0...76.0
1000H.: (70.0...78.0)
7th speed 1/min: 500
Del.quantity cm³/: 72.0...80.0
1000H.: (70.0...82.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 10...12.0
1000H.: (6.0...16.0)
2nd speed 1/min: 500
Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 80.0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H : 80.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5.0...5.4
MS mm : 1.1...1.5
SVS max. mm : 3.8

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P23
Edition : 21.06.90
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 4/12F1150 R374-1
Type number : 0 460 424 063
Customer Part-No. : 3 917 021

Customer-specific information
Customer : CUM

Engine : 4BTA 3.9 IND.

Power k: 82
Speed 1/mi: 2300

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.55
mm: $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 850
Charge press. hPa: 1000
Setting value mm: 4.0...4.4

Supply-pump pressure:

Speed 1/min: 850
Charge press. hPa: 1000
Setting value bar: 5.6...6.2

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 85.5...86.5
Dispersion cm³ : 4.0
1000H.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 79.5...80.5

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm³/
1000H.: 8.0...14.0
Dispersion cm³ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1220
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 62.5...68.5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 60.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
TD travel mm: 1.8...2.6
mm: (1.5...2.9)
2nd speed 1/min: 850
Charge press. hPa: 1000

TD travel mm: 4.0...4.4
mm: (3.5...4.9)
3rd speed 1/min: 1150
Charge press. hPa: 1000
TD travel mm: 5.2...6.0
mm: (4.9...6.3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 4.0...4.6
2nd speed 1/min: 850
Charge press. hPa: 1000
Supply-pump pressure bar: 5.6...6.2
3rd speed 1/min: 1150
Charge press. hPa: 1000
Supply-pump pressure bar: 6.9...7.5

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1150
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 350
Del.quantity cm³/: 79.5...80.5
1000H.: (76.0...84.0)
2nd speed 1/min: 1320
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: -
3rd speed 1/min: 1260
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: -
4th speed 1/min: 1220
Charge press. hPa: 1000
Del.quantity cm³/: 62.5...68.5
1000H.: (59.5...71.5)
5th speed 1/min: 1150
Charge press. hPa: 1000
Del.quantity cm³/: 76.0...79.0
1000H.: (74.5...80.5)
6th speed 1/min: 1000
Charge press. hPa: 1000
Del.quantity cm³/: 79.5...82.5
1000H.: (77.5...84.5)
7th speed 1/min: 850

Charge press. hPa: 1000
Del.quantity cm³/: 85.5...86.5
1000H.: (83.0...89.0)
8th speed 1/min: 700
Charge press. hPa: 350
Del.quantity cm³/: 79.5...80.5
1000H.: (76.0...84.0)
9th speed 1/min: 500
Del.quantity cm³/: 63.5...64.5
1000H.: (60.0...68.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8.0...14.0
1000H.: (6.0...16.0)
2nd speed 1/min: 450
Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 60.0
2nd speed 1/min: 230
Del.quantity cm³/: -
max. 1000H : 60.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5.0...5.4
MS mm : 1.0...1.4
SVS max. mm : 2.6

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P33
Edition : 22.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1400 R389-1
Type number : 0 460 424 066

Customer-specific information
Customer : CUM

Engine : 4BT-390

Power k: 77
Speed 1/mi: 2800

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.66
mm: $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 1.8...2.2

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 4.7...5.3

Full-load del. with charge press.:

Speed 1/min: 900
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 69.5...70.5
Dispersion cm3/ : 4.0
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 36.5...37.5

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8.0...14.0
Dispersion cm3/ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 54.0..60.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 40.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 900
Charge press. hPa: 1000
TD travel mm: 0.3...1.1
mm: (0.0...1.4)
2nd speed 1/min: 1100
Charge press. hPa: 1000

TD travel mm: 1.8...2.2
mm: (1.3...2.7)
3rd speed 1/min: 1400
Charge press. hPa: 1000
TD travel mm: 2.9...3.7
mm: (2.6...4.0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 2.1...2.7
2nd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump pressure bar: 4.7...5.3
3rd speed 1/min: 1400
Charge press. hPa: 1000
Supply-pump pressure bar: 5.9...6.5

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1400
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 400
Del.quantity cm³/: 67.0...68.0
1000H.: (63.5...71.5)
2nd speed 1/min: 1650
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: -
3rd speed 1/min: 1590
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: -
4th speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm³/: 54.0...60.0
1000H.: (51.0...63.0)
5th speed 1/min: 1400
Charge press. hPa: 1000
Del.quantity cm³/: 64.5...67.5
1000H.: (63.0...69.0)
6th speed 1/min: 900
Charge press. hPa: 1000
Del.quantity cm³/: 69.5...70.5
1000H.: (67.0...73.0)
7th speed 1/min: 700

Charge press. hPa: 400
Del.quantity cm³/: 67.0...68.0
1000H.: (63.5...71.5)
8th speed 1/min: 500
Del.quantity cm³/: 36.5...37.5
1000H.: (33.0...41.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8.0...14.0
1000H.: (6.0...16.0)
2nd speed 1/min: 600
Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 150
Del.quantity cm³/: -
ind. 1000H: 40.0
2nd speed 1/min: 380
Del.quantity cm³/: -
max. 1000H : 40.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5.0...5.4
MS mm : 0.8...1.2
SVS max. mm : 2.7

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P32
Edition : 22.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1400 R389-1
Type number : 0 460 424 066
Customer Part-No. : 3 917 018

Customer-specific information
Customer : CUM

Engine : 4BT-390

Power k: 77
Speed 1/mi: 2800

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): ±0.02(0.04)

Start of delivery block
Piston stroke mm: 1.66
mm: ±0.02(0.06)

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 1.8...2.2

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 4.7...5.3

Full-load del. with charge press.:

Speed 1/min: 900
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 69.5...70.5
Dispersion cm3/ : 4.0
1000H. : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 36.5...37.5

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8.0...14.0
Dispersion cm3/ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 54.0...60.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 40.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 900
Charge press. hPa: 1000
TD travel mm: 0.3...1.1
mm: (0.0...1.4)
2nd speed 1/min: 1100
Charge press. hPa: 1000

TD travel mm: 1.8...2.2
mm: (1.3...2.7)
3rd speed 1/min: 1400
Charge press. hPa: 1000
TD travel mm: 2.9...3.7
mm: (2.6...4.0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 2.1...2.7
2nd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump pressure bar: 4.7...5.3
3rd speed 1/min: 1400
Charge press. hPa: 1000
Supply-pump pressure bar: 5.9...6.5

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1400
Charge press. hPa: 1000
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 400
Del.quantity cm3/: 67.0...68.0
1000H.: (63.5...71.5)
2nd speed 1/min: 1650
Charge press. hPa: 1000
Del.quantity cm3/: 0.0...3.0
1000H.: -
3rd speed 1/min: 1590
Charge press. hPa: 1000
Del.quantity cm3/: 15.0...55.0
1000H.: -
4th speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm3/: 54.0...60.0
1000H.: (51.0...63.0)
5th speed 1/min: 1400
Charge press. hPa: 1000
Del.quantity cm3/: 64.5...67.5
1000H.: (63.0...69.0)
6th speed 1/min: 900
Charge press. hPa: 1000
Del.quantity cm3/: 69.5...70.5
1000H.: (67.0...73.0)
7th speed 1/min: 700

Charge press. hPa: 400
Del.quantity cm3/: 67.0...68.0
1000H.: (63.5...71.5)
8th speed 1/min: 500
Del.quantity cm3/: 36.5...37.5
1000H.: (33.0...41.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400
Del.quantity cm3/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm3/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm3/: 8.0...14.0
1000H.: (6.0...16.0)
2nd speed 1/min: 600
Del.quantity cm3/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 150
Del.quantity cm3/: -
ind. 1000H: 40.0
2nd speed 1/min: 380
Del.quantity cm3/: -
max. 1000H : 40.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : -
KF mm : 5.0...5.4
MS mm : 0.8...1.2
SVS max. mm : 2.7

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 N32
Edition : 10.07.90
replaces : 17.01.90
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1400 R390
Type number : 0 460 424 067

Customer-specific information
Customer : CDC

Engine : 4 BTA 3.9

Power k: 92
Speed 1/mi: 2800

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.95
mm: $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 2.2...2.6

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 5.7...6.3

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 82.0...83.0
Dispersion cm³/
1000H.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 55.5...56.5

Low-idle speed regulation:

Speed 1/min: 400
Charge press. hPa: -
Del.quantity cm³/
1000H.: 4.0...6.0
Dispersion cm³/
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1500
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 48.5...54.5

Start:

Speed 1/min: 100
Charge press. hPa: -
mind cm³/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 850
Charge press. hPa: 1000
TD travel mm: 0.7...1.5
mm: (0.4...1.8)
2nd speed 1/min: 1100
Charge press. hPa: 1000

TD travel mm: 2.2...2.6
 mm: (1.7...3.1)
 3rd speed 1/min: 1250
 Charge press. hPa: 1000
 TD travel mm: 2.8...3.6
 mm: (2.5...3.9)

Supply-pump pressure characteristic:

1st speed 1/min: 500
 Charge press. hPa: 1000
 Supply-pump pressure bar: 3.2...3.8
 2nd speed 1/min: 850
 Charge press. hPa: 1000
 Supply-pump pressure bar: 4.7...5.3
 3rd speed 1/min: 1100
 Charge press. hPa: 1000
 Supply-pump pressure bar: 5.7...6.3
 4th speed 1/min: 1250
 Charge press. hPa: 1000
 Supply-pump pressure bar: 6.3...6.9

Overflow quantity at overflow valve:

1st speed 1/min: 500
 Charge press. hPa: -
 Overflow quantity cm³/10s: 41...83
 quantity cm³/10s: (26...98)
 2nd speed 1/min: 1400
 Charge press. hPa: 1000
 Overflow quantity cm³/10s: 55...138
 quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
 Charge-air pressure-setting point hPa: 330
 Del.quantity cm³/: 64.5...65.5
 1000H.: (61.0...69.0)
 2nd speed 1/min: 1640
 Charge press. hPa: 1000
 Del.quantity cm³/: 0.0...3.0
 1000H.: -
 3rd speed 1/min: 1560
 Charge press. hPa: 1000
 Del.quantity cm³/: 15.0...45.0
 1000H.: -
 4th speed 1/min: 1500
 Charge press. hPa: 1000
 Del.quantity cm³/: 48.5...54.5
 1000H.: (45.5...57.5)
 5th speed 1/min: 1400
 Charge press. hPa: 1000
 Del.quantity cm³/: 71.0...74.0
 1000H.: (69.5...75.5)

6th speed 1/min: 1100
 Charge press. hPa: 1000
 Del.quantity cm³/: 77.0...80.0
 1000H.: (75.0...82.0)
 7th speed 1/min: 750
 Charge press. hPa: 1000
 Del.quantity cm³/: 82.0...83.0
 1000H.: (79.5...85.5)
 8th speed 1/min: 500
 Charge press. hPa: 1000
 Del.quantity cm³/: 94.0...104.0
 1000H.: -
 9th speed 1/min: 500
 Charge press. hPa: -
 Del.quantity cm³/: 55.5...56.5
 1000H.: (52.0...60.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400
 Del.quantity cm³/: 0..3
 1000H.: -

Electr. shutoff:

Speed 1/min: 400
 ELAB volt: -
 Del.quantity cm³/: 0.0...3.0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
 Del.quantity cm³/: 4.0...6.0
 1000H.: (0.0...10.0)
 2nd speed 1/min: 450
 Del.quantity cm³/: 0.0...4.0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 230
 Charge press. hPa: -
 ind. 1000H: 80.0
 2nd speed 1/min: 400
 Charge press. hPa: -
 max. 1000H : 80.0

Shutoff electromagnet:

Cut-in
 min. voltage : 10.0
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : K-OT
MS mm : 1.0...1.4
SVS max. mm : 1.2

Remarks:

Overflow restriction 0.75 mm - Part No.
..343,..344

* Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P30
Edition : 22.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1050 R378-6
Type number : 0 460 424 071

Customer-specific information
Customer : CUM

Engine : 4BT 390 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.8
mm: $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Setting value mm: 2.3...2.7

Supply-pump pressure:

Speed 1/min: 900
Setting value bar: 4.1...4.7

Full-load del. w/out charge press.:

Speed 1/min : 900
Del.quantity cm³/
1000H.: 65.5...66.5
Dispersion cm³/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 370
Del.quantity cm³/
1000H.: 15.0...17.0
Dispersion cm³/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1085
Del.quantity cm³/
1000H.: 52.0...58.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 65.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
TD travel mm: 1.3...2.1
mm: (1.0...2.4)
2nd speed 1/min: 900
TD travel mm: 2.3...2.7
mm: (1.8...3.2)
3rd speed 1/min: 1050
TD travel mm: 2.8...3.6
mm: (2.5...3.9)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.5...3.1
2nd speed 1/min: 900
Supply-pump
pressure bar: 4.1...4.7
3rd speed 1/min: 1050

Supply-pump
pressure bar: 4.8...5.4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1050
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1190
Del.quantity cm³/: 0.0...3.0
1000H.: -
2nd speed 1/min: 1120
Del.quantity cm³/: 15.0...55.0
1000H.: -
3rd speed 1/min: 1085
Del.quantity cm³/: 52.0...58.0
1000H.: (49.0...61.0)
4th speed 1/min: 1050
Del.quantity cm³/: 62.5...65.5
1000H.: (61.0...67.0)
5th speed 1/min: 900
Del.quantity cm³/: 65.5...66.5
1000H.: (63.0...69.0)
6th speed 1/min: 750
Del.quantity cm³/: 66.5...70.5
1000H.: (64.5...72.5)
7th speed 1/min: 500
Del.quantity cm³/: 66.0...74.0
1000H.: (64.0...76.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 370
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 370
Del.quantity cm³/: 15...17.0
1000H.: (11...21.0)
2nd speed 1/min: 500
Del.quantity cm³/: 0.0...4.0

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 70.0

2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H : 70.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5.0...5.4
MS	mm	:	1.1...1.5
SVS max.	mm	:	3.8
XK	mm	:	18.8...20.8
XL	mm	:	10.9...14.3

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P31
Edition : 22.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1050 R389
Type number : 0 460 426 065
Customer Part-No. : 3 917 517

Customer-specific information
Customer : CUM

Engine : 4BT-390 AUTOM.

Power k: 78
Speed 1/mi: 2100

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.2
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.0
mm: $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value mm: 3.4...3.8

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value bar: 5.0...5.6

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 89.5...90.5
Dispersion cm3/ : 4.0
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 63.5...64.5

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8.0...14.0
Dispersion cm3/ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 59.0...65.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 60.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
TD travel mm: 1.7...2.5
mm: (1.4...2.8)
2nd speed 1/min: 750
Charge press. hPa: 1000

TD travel mm: 3.4...3.8
mm: (2.9...4.3)
3rd speed 1/min: 1050
Charge press. hPa: 1000
TD travel mm: 4.7...5.5
mm: (4.4...5.8)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 3.9...4.5
2nd speed 1/min: 750
Charge press. hPa: 1000
Supply-pump pressure bar: 5.0...5.6
3rd speed 1/min: 1050
Charge press. hPa: 1000
Supply-pump pressure bar: 6.3...6.9

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1050
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 350
Del.quantity cm³/: 79.5...80.5
1000H.: (76.0...84.0)
2nd speed 1/min: 1180
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: -
3rd speed 1/min: 1120
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: -
4th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/: 59.0...65.0
1000H.: (56.0...68.0)
5th speed 1/min: 1050
Charge press. hPa: 1000
Del.quantity cm³/: 76.5...79.5
1000H.: (75.0...81.0)
6th speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/: 89.5...90.5
1000H.: (87.0...93.0)
7th speed 1/min: 700

Charge press. hPa: 350
Del.quantity cm³/: 79.5...80.5
1000H.: (76.0...84.0)
8th speed 1/min: 500
Del.quantity cm³/: 63.5...64.5
1000H.: (60.0...68.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8.0...14.0
1000H.: (6.0...16.0)
2nd speed 1/min: 450
Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 60.0
2nd speed 1/min: 230
Del.quantity cm³/: -
max. 1000H : 60.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : -
KF mm : 5.6...6.0
MS mm : 0.9...1.3
SVS max. mm : 2.2

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W55
Edition : 21.06.90
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 6/12F1250 R372
Type number : 0 460 426 141
Customer Part-No. : 3 916 948

Customer-specific information
Customer : CUM

Engine : 6BT-5.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.5
mm: $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

Setting value mm: 3.4...3.8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3.5...4.1

Full-load del. w/out charge press.:

Speed 1/min : 1100
Del.quantity cm³/
1000H.: 68.5...71.5

Low-idle speed regulation:

Speed 1/min: 360
Del.quantity cm³/
1000H.: 8.0...14.0
Dispersion cm³/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1300
Del.quantity cm³/
1000H: 51.0...57.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 60.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1.3...2.1
mm: (1.0...2.4)
2nd speed 1/min: 750
TD travel mm: 3.4...3.8
mm: (2.9...4.3)
3rd speed 1/min: 1100
TD travel mm: 5.2...6.0
mm: (4.9...6.3)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.4...3.0
2nd speed 1/min: 750
Supply-pump
pressure bar: 3.5...4.1
3rd speed 1/min: 1100
Supply-pump
pressure bar: 4.8...5.4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400
Del.quantity cm³/: 0.0...3.0
1000H.: -
2nd speed 1/min: 1390
Del.quantity cm³/: 0.0...15.0
1000H.: -
3rd speed 1/min: 1350
Del.quantity cm³/: 15.0...55.0
1000H.: -
4th speed 1/min: 1300
Del.quantity cm³/: 51.0...57.0
1000H.: (48.0...60.0)
5th speed 1/min: 1250
Del.quantity cm³/: 68.5...71.5
1000H.: (67.0...73.0)
6th speed 1/min: 1100
Del.quantity cm³/: 73.0...74.0
1000H.: (70.5...76.5)
7th speed 1/min: 900
Del.quantity cm³/: 74.5...78.5
1000H.: (72.5...80.5)
8th speed 1/min: 500
Del.quantity cm³/: 64.0...72.0
1000H.: (62.0...74.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 360
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 360
Del.quantity cm³/: 8.0...14.0
1000H.: (6.0...16.0)
2nd speed 1/min: 450
Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 70.0
2nd speed 1/min: 240
Del.quantity cm³/: -
max. 1000H.: 70.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5.0...5.4
MS	mm	:	0.6...1.0
XK	mm	:	18.8...20.8
XL	mm	:	11.1...14.5

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W5
Edition : 20.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1325 R367-1
Type number : 0 460 426 146
Customer Part-No. : 3 916 905

Customer-specific information
Customer : CUM

Engine : 6BT 5.9 IND.

Power k: 97
Speed 1/mi: 2650

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 0.35

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): +0.02(0.04)

Start of delivery block
Piston stroke mm: 1.5
mm: +0.02(0.06)

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 850
Setting value mm: 3.9...4.3

Supply-pump pressure:

Speed 1/min: 850
Setting value bar: 3.9...4.5

Full-load del. w/out charge press.:

Speed 1/min : 1100
Del.quantity cm3/
1000H.: 56.0...57.0
Dispersion cm3/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8.0...14.0
Dispersion cm3/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1400
Del.quantity cm3/
1000H.: 36.0...42.0

Start:

Speed 1/min: 100
mind cm3/1000H.: 60.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1.3...2.1
mm: (1.0...2.4)
2nd speed 1/min: 850
TD travel mm: 3.9...4.3
mm: (3.4...4.8)
3rd speed 1/min: 1100
TD travel mm: 5.9...6.7
mm: (5.6...7.0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.5...3.1
2nd speed 1/min: 850

Supply-pump
pressure bar: 3.9...4.5
3rd speed 1/min: 1100
Supply-pump
pressure bar: 4.9...5.5

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1325
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1520
Del.quantity cm³/: 0.0...3.0
1000H.: -
2nd speed 1/min: 1440
Del.quantity cm³/: 15.0...45.0
1000H.: -
3rd speed 1/min: 1400
Del.quantity cm³/: 36.0...42.0
1000H.: (33.0...45.0)
4th speed 1/min: 1325
Del.quantity cm³/: 52.5...55.5
1000H.: (51.0...57.0)
5th speed 1/min: 1100
Del.quantity cm³/: 56.0...57.0
1000H.: (53.5...59.5)
6th speed 1/min: 850
Del.quantity cm³/: 53.5...57.5
1000H.: (51.5...59.5)
7th speed 1/min: 500
Del.quantity cm³/: 38.5...46.5
1000H.: (36.5...48.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1325
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8.0...14.0
1000H.: (6.0...16.0)
2nd speed 1/min: 450

Del.quantity cm³/: 9.0...13.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
ind. 1000H: 65.0

2nd speed 1/min: 250
max. 1000H : 65.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5.0...5.4
MS	mm	: 1.3...1.7

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W60
Edition : 21.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R376
Type number : 3 917 560

Customer-specific information
Customer : CUM

Engine : 6BT-5.9 IND.

Power k: 104
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.5
mm: $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3.1...3.5

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 4.1...4.7

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm3/
1000H.: 83.5...84.5
Dispersion cm3/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 360
Del.quantity cm3/
1000H.: 8.0...14.0
Dispersion cm3/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1150
Del.quantity cm3/
1000H.: 56.0...62.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 80.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1.0...1.8
mm: (0.7...2.1)
2nd speed 1/min: 750
TD travel mm: 3.1...3.5
mm: (2.6...4.0)
3rd speed 1/min: 1100
TD travel mm: 5.6...6.4
mm: (5.3...6.7)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 3.0...3.6
2nd speed 1/min: 750

Supply-pump
pressure bar: 4.1...4.7
3rd speed 1/min: 1100
Supply-pump
pressure bar: 5.7...6.3

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300
Del.quantity cm3/: 0.0...3.0
1000H.: -
2nd speed 1/min: 1175
Del.quantity cm3/: 15.0...55.0
1000H.: -
3rd speed 1/min: 1150
Del.quantity cm3/: 56.0...62.0
1000H.: (53.0...65.0)
4th speed 1/min: 1100
Del.quantity cm3/: 69.5...72.5
1000H.: (68.0...74.0)
5th speed 1/min: 900
Del.quantity cm3/: 71.5...74.5
1000H.: (69.5...76.5)
6th speed 1/min: 750
Del.quantity cm3/: 83.5...84.5
1000H.: (81.0...87.0)
7th speed 1/min: 500
Del.quantity cm3/: 81.0...89.0
1000H.: (79.0...91.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm3/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 360
ELAB volt: -
Del.quantity cm3/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 360
Del.quantity cm3/: 8.0...14.0
1000H.: (6.0...16.0)
2nd speed 1/min: 460

Del.quantity cm3/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm3/: -
ind. 1000H: 95.0

2nd speed 1/min: 250
Del.quantity cm3/: -
max. 1000H : 95.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5.0...5.4
MS	mm	: 1.2...1.6
SVS max.	mm	: 1.8
XK	mm	: 18.8...20.8
XL	mm	: 11.9...15.3

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W61
Edition : 21.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1400 R377
Type number : 0 460 426 148
Customer Part-No. : 3 916 907

Customer-specific information

Remarks:

Operate control lever after each
manifold-pressure compensator pressure
change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W62
Edition : 21.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1400 R377
Type number : 0 460 426 148
Customer Part-No. : 3 916 907

Customer-specific information
Customer : CUM

Engine : 6BTA-5.9 IND.

Power k: 143
Speed 1/mi: 2500

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 2.4
mm: $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 1.5...1.9

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 6.3...6.9

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 82.5...83.5
Dispersion cm3/ : 4.0
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 73.0...74.0

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 8.0...14.0
Dispersion cm3/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1510
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 56.0...62.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 100.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000
Charge press. hPa: 1000
TD travel mm: 0.8...1.6
mm: (0.5...1.9)
2nd speed 1/min: 1100
Charge press. hPa: 1000

TD travel mm: 1.5...1.9
mm: (1.0...2.4)
3rd speed 1/min: 1400
Charge press. hPa: 1000
TD travel mm: 2.7...3.5
mm: (2.4...3.8)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 3.5...4.1
2nd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump pressure bar: 6.3...6.9
3rd speed 1/min: 1400
Charge press. hPa: 1000
Supply-pump pressure bar: 7.7...8.3

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1400
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 550
Del.quantity cm³/: 79.5...80.5
1000H.: (76.0...84.0)
2nd speed 1/min: 1650
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: -
3rd speed 1/min: 1550
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: -
4th speed 1/min: 1510
Charge press. hPa: 1000
Del.quantity cm³/: 56.0...62.0
1000H.: (53.0...65.0)
5th speed 1/min: 1400
Charge press. hPa: 1000
Del.quantity cm³/: 75.5...78.5
1000H.: (74.0...80.0)
6th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/: 80.0...83.0
1000H.: (78.0...85.0)
7th speed 1/min: 850

Charge press. hPa: 1000
Del.quantity cm³/: 82.5...83.5
1000H.: (80.0...86.0)
8th speed 1/min: 700
Charge press. hPa: 550
Del.quantity cm³/: 79.5...80.5
1000H.: (76.0...84.0)
9th speed 1/min: 500
Del.quantity cm³/: 73.0...74.0
1000H.: (69.5...77.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 8.0...14.0
1000H.: (6.0...16.0)
2nd speed 1/min: 450
Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 240
Del.quantity cm³/: -
ind. 1000H: 90.0
2nd speed 1/min: 370
Del.quantity cm³/: -
max. 1000H : 100.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : -
MS mm : 0.8...1.2
SVS max. mm : 3.6

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W57
Edition : 19.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R373-4
Type number : 0 460 426 150

Customer-specific information
Customer : CUM

Engine : 6BT-590

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.85
mm: $\pm 0.02(0.04)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 1000

Setting value mm: 1.4...1.8

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value bar: 3.2...3.8

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 82.0...83.0
Dispersion cm³ : 4.0
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 40.0...41.0

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm³/
1000H.: 4.0...8.0
Dispersion cm³ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1300
Charge press. hPa: 1000
Del.quantity cm³/
1000H: 65.0...71.0

Start:

Speed 1/min: 100
mind cm³/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000
TD travel mm: 0.4...1.2
mm: (0.1...1.5)

2nd speed 1/min: 750
Charge press. hPa: 1000
TD travel mm: 1.4...1.8
mm: (0.9...2.3)

3rd speed 1/min: 1050
Charge press. hPa: 1000

TD travel mm: 2.3...3.1
mm: (2.0...3.4)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 2.1...2.7
2nd speed 1/min: 750
Charge press. hPa: 1000
Supply-pump pressure bar: 3.2...3.8
3rd speed 1/min: 1050
Charge press. hPa: 1000
Supply-pump pressure bar: 4.3...4.9

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1250
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting point hPa: 450
Del.quantity cm³/: 67.0...68.0
1000H.: (63.0...72.0)
2nd speed 1/min: 1400
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: -
3rd speed 1/min: 1330
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: -
4th speed 1/min: 1300
Charge press. hPa: 1000
Del.quantity cm³/: 65.0...71.0
1000H.: (62.0...74.0)
5th speed 1/min: 1250
Charge press. hPa: 1000
Del.quantity cm³/: 73.5...76.5
1000H.: (72.0...78.0)
6th speed 1/min: 1050
Charge press. hPa: 1000
Del.quantity cm³/: 78.0...81.0
1000H.: (76.5...82.5)
7th speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/: 82.0...83.0
1000H.: (79.5...85.5)
8th speed 1/min: 700

Charge press. hPa: 450
Del.quantity cm³/: 67.0...68.0
1000H.: (63.0...72.0)
9th speed 1/min: 500
Del.quantity cm³/: 40.0...41.0
1000H.: (36.0...45.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

Mfg. date: until : -
1st speed 1/min: 375
Del.quantity cm³/: 4.0...8.0
1000H.: (1.0...11.0)
2nd speed 1/min: 500
Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 200
ind. 1000H: 60.0
2nd speed 1/min: 370
max. 1000H : 60.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : -
KF mm : 5.0...5.4
MS mm : 1.2...1.6
SVS max. mm : 2.2

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W59
Edition : 19.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R373-5
Type number : 0 460 426 151

Customer-specific information
Customer : CUM

Engine : 6BT 5.9 IND.

TEST BENCH REQUIREMENTS

Calibrating oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated plate
diameter mm : 0.5

Test inj. tubing : 1 688 901 027

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.85
mm: $\pm 0.02(0.06)$

Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 1000

Setting value mm: 1.3...1.7

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value bar: 3.2...3.8

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del. quantity cm³/
1000H.: 83.0...84.0
Dispersion cm³ : 4.0
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del. quantity cm³/
1000H.: 67.5...68.5
Dispersion cm³ : 9.0
1000H.: -

Low-idle speed regulation:

Speed 1/min: 375
Del. quantity cm³/
1000H.: 9.0...13.0
Dispersion cm³ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1150
Charge press. hPa: 1000
Del. quantity cm³/
1000H: 60.0...66.0

Start:

Speed 1/min: 100
mind cm³/1000H.: 80.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000
TD travel mm: 0.4...1.2
mm: (0.1...1.5)

2nd speed 1/min: 750
Charge press. hPa: 1000
TD travel mm: 1.3...1.7
mm: (0.8...2.2)

3rd speed 1/min: 1100

Charge press. hPa: 1000
TD travel mm: 2.2...3.0
mm: (1.9...3.0) λ

Supply-pump pressure characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000
Supply-pump pressure bar: 2.6...3.2
2nd speed 1/min: 750
Charge press. hPa: 1000
Supply-pump pressure bar: 3.2...3.8
3rd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump pressure bar: 4.7...5.3

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700*
Charge-air pressure-setting point hPa: 400
Del.quantity cm³/: 77.5...78.5
1000H.: (73.5...82.5)
2nd speed 1/min: 1260
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: -
3rd speed 1/min: 1200
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: -
4th speed 1/min: 1150
Charge press. hPa: 1000
Del.quantity cm³/: 60.0...66.0
1000H.: (57.0...69.0)
5th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/: 78.5...81.5
1000H.: (77.0...83.0)
6th speed 1/min: 900
Charge press. hPa: 1000
Del.quantity cm³/: 80.5...83.5
1000H.: (79.0...85.0)
7th speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/: 83.0...84.0
1000H.: (80.5...86.5)

8th speed 1/min: 700
Charge press. hPa: 400
Del.quantity cm³/: 77.5...78.5
1000H.: (73.5...82.5)
9th speed 1/min: 500
Del.quantity cm³/: 67.5...68.5
1000H.: (63.5...72.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

Mfg. date: until : -
1st speed 1/min: 375
Del.quantity cm³/: 9.0...13.0
1000H.: (6.0...16.0)
2nd speed 1/min: 500
Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 280
ind. 1000H: 80.0
2nd speed 1/min: 440
max. 1000H : 80.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5.0...5.4
MS mm : 1.0...1.4

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W58
Edition : 21.06.90
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 6/12F1100 R373-5
Type number : 0 460 426 151
Customer Part-No. : 3 916 911

Customer-specific information
Customer : CUM

Engine : 6BT 5.9 IND.

Power k: 128
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.85
mm: $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value mm: 1.3...1.7

Supply-pump pressure:

Speed 1/min: 750
Charge press. hPa: 1000
Setting value bar: 3.2...3.8

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 83.0...84.0
Dispersion cm³/ : 4.0
1000H.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 67.5...68.5
Dispersion cm³/ : 9.0
1000H.: (9.0)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm³/
1000H.: 9.0...13.0
Dispersion cm³/ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1150
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 60.0...66.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 80.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000
TD travel mm: 0.4...1.2
mm: (0.1...1.5)

2nd speed 1/min: 750
 Charge press. hPa: 1000
 TD travel mm: 1.3...1.7
 mm: (0.8...2.2)
 3rd speed 1/min: 1100
 Charge press. hPa: 1000
 TD travel mm: 2.2...3.0
 mm: (1.9...3.3)

Supply-pump pressure characteristic:

1st speed 1/min: 600
 Charge press. hPa: 1000
 Supply-pump pressure bar: 2.6...3.2
 2nd speed 1/min: 750
 Charge press. hPa: 1000
 Supply-pump pressure bar: 3.2...3.8
 3rd speed 1/min: 1100
 Charge press. hPa: 1000
 Supply-pump pressure bar: 4.7...5.3

Overflow quantity at overflow valve:

1st speed 1/min: 500
 Overflow : 41...83
 quantity cm³/10s: (26...98)
 2nd speed 1/min: 1100
 Charge press. hPa: 1000
 Overflow : 55...138
 quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
 Charge-air pressure-setting point hPa: 400
 Del.quantity cm³/: 77.5...78.5
 1000H.: (73.5...82.5)
 2nd speed 1/min: 1260
 Charge press. hPa: 1000
 Del.quantity cm³/: 0.0...3.0
 1000H.: -
 3rd speed 1/min: 1200
 Charge press. hPa: 1000
 Del.quantity cm³/: 15.0...55.0
 1000H.: -
 4th speed 1/min: 1150
 Charge press. hPa: 1000
 Del.quantity cm³/: 60.0...66.0
 1000H.: (57.0...69.0)
 5th speed 1/min: 1100
 Charge press. hPa: 1000
 Del.quantity cm³/: 78.5...81.5
 1000H.: (77.0...83.0)
 6th speed 1/min: 900
 Charge press. hPa: 1000

Del.quantity cm³/: 80.5...83.5
 1000H.: (79.0...85.0)
 7th speed 1/min: 750
 Charge press. hPa: 1000
 Del.quantity cm³/: 83.0...84.0
 1000H.: (80.5...86.5)
 8th speed 1/min: 700
 Charge press. hPa: 400
 Del.quantity cm³/: 77.5...78.5
 1000H.: (73.5...82.5)
 9th speed 1/min: 500
 Del.quantity cm³/: 67.5...68.5
 1000H.: (63.5...72.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
 Del.quantity cm³/: 0...3
 1000H.: -

Electr. shutoff:

Speed 1/min: 375
 ELAB volt: -
 Del.quantity cm³/: 0.0...3.0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
 Del.quantity cm³/: 9.0...13.0
 1000H.: (6.0...16.0)
 2nd speed 1/min: 500
 Del.quantity cm³/: 0.0...4.0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 280
 Del.quantity cm³/: -
 ind. 1000H: 80.0
 2nd speed 1/min: 440
 Del.quantity cm³/: -
 max. 1000H : 80.0

Shutoff electromagnet:

Cut-in
 min. voltage : 10.0
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : -
 KF mm : 5.0...5.4
 MS mm : 1.0...1.4

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W49
Edition : 03.05.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R381-2
Type number : 0 460 426 154
Customer Part-No. : 3 917 011

Customer-specific information
Customer : CDC

Engine : 6 BT - 5.9 IND.

Power k: 93.0
Speed 1/mi: 2300

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0.3
(from BDC): +0.02(0.04)

Start of delivery block
Piston stroke mm : 1.5
mm : +0.02(0.06)

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3.4...3.8

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3.5...4.1

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm3/
1000H.: 61.0...62.0
Dispersion cm3/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 10.0...12.0
Dispersion cm3/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1150
Del.quantity cm3/
1000H: 39.0...45.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 75.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1.5...2.3
mm: (1.2...2.6)

2nd speed 1/min: 750
TD travel mm: 3.4...3.8
mm: (2.9...4.3)

3rd speed 1/min: 1100
TD travel mm: 5.6...6.4
mm: (5.3...6.7))

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.4...3.0
2nd speed 1/min: 750

Supply-pump
pressure bar: 3.5...4.1
3rd speed 1/min: 1100
Supply-pump
pressure bar: 4.8...5.4

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1250
Del.quantity cm³/: 0.0...3.0
1000H.: -
2nd speed 1/min: 1170
Del.quantity cm³/: 15.0...55.0
1000H.: (15.0...55.0)
3rd speed 1/min: 1150
Del.quantity cm³/: 39.0...45.0
1000H.: (36.0...48.0)
4th speed 1/min: 1150
Del.quantity cm³/: 58,5...61,5
1000H.: (57.0...63.0)
5th speed 1/min: 1100
Del.quantity cm³/: 60,0...63,0
1000H.: (59.5...66.5)
6th speed 1/min: 750
Del.quantity cm³/: 62.0...63.0
1000H.: (59.5...65.5)
7th speed 1/min: 500
Del.quantity cm³/: 57.0...65.0
1000H.: -

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 10...12
1000H.: (6.0...16.0)
2nd speed 1/min: 500

Del.quantity cm³/: 0.0...4.0
1000H.: (0.0...4.0)

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H.: 70.0

2nd speed 1/min: 300
Del.quantity cm³/: -
max. 1000H.: 80.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5.0...5.4
MS mm : 1.2...1.6
SVS max. mm : -

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W25
Edition : 18.06.90
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 6/12F1100 R371-1
Type number : 0 460 426 158

Customer-specific information
Customer : CASE

Engine : 6T-590

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6
x Wall thickness : 2
x Length mm : 840

Start of delivery
Prestroke mm : 0,2
(from BDC): +0,02(0,04)

Start of delivery block
Piston stroke mm : 1,5
mm : +0,02(0,06)

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3,1...3,5

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 4,9...5,5

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm3/
1000H.: 57,5...58,5
Dispersion cm3/: 4,0
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 450
Del.quantity cm3/
1000H.: 9,0...13,0
Dispersion cm3/: 5,5
1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1160
Del.quantity cm3/
1000H: 37,0...43,0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 65,0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1,0...1,8
mm: (0,7...2,1)
2nd speed 1/min: 750
TD travel mm: 3,1...3,5
mm: (2,6...4,0)
3rd speed 1/min: 1100
TD travel mm: 5,4...6,2
mm: (5,1...6,5)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 3,8...4,4
2nd speed 1/min: 750
Supply-pump
pressure bar: 4,9...5,5
3rd speed 1/min: 1100

Supply-pump
pressure bar: 6,4...7,0

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1230
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1180
Del.quantity cm³/: 13,0...33,0
1000H.: -
3rd speed 1/min: 1160
Del.quantity cm³/: 37,0...43,0
1000H.: (34,0...46,0)
4th speed 1/min: 1100
Del.quantity cm³/: 55,5...58,5
1000H.: (54,0...60,0)
5th speed 1/min: 750
Del.quantity cm³/: 57,5...58,5
1000H.: (55,0...61,0)
6th speed 1/min: 500
Del.quantity cm³/: 40,5...48,5
1000H.: (38,5...50,5)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 425
ELAB volt: -
Del.quantity cm³/: 0,0...3,0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 450
Del.quantity cm³/: 9,0...13,0
1000H.: (6,0...16,0)
2nd speed 1/min: 550
Del.quantity cm³/: 0,0...4,0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 180
Del.quantity cm³/: -
ind. 1000H: 65.0
2nd speed 1/min: 350

Del.quantity cm³/: -
max. 1000H : 57,5

Shutoff electromagnet:

Cut-in
min. voltage : 10,0
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,0...5,4
MS	mm	:	0,8...1,2
SVS max.	mm	:	4,1
XK	mm	:	18,8...20,8
XL	mm	:	10,2...13,6

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W16
Edition : 21.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R367-2
Type number : 0 460 426 165
Customer Part-No. : 3 916 939

Customer-specific information
Customer : CUM

Engine : 6BTA 5.9 IND.

Power k: 105
Speed 1/mi: 2200

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.5
mm : $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3.8...4.2

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3.6...4.2

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm³/
1000H.: 69.0...70.0
Dispersion cm³/
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm³/
1000H.: 8.0...14.0
Dispersion cm³/
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1150
Del.quantity cm³/
1000H.: 52.5...58.5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 60.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1.6...2.4
mm: (1.3...2.7)
2nd speed 1/min: 750
TD travel mm: 3.8...4.2
mm: (3.3...4.7)
3rd speed 1/min: 1100
TD travel mm: 6.0...6.8
mm: (5.7...7.1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.4...3.0
2nd speed 1/min: 750

Supply-pump
pressure bar: 3.6...4.2
3rd speed 1/min: 1100
Supply-pump
pressure bar: 5.1...5.7

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1100
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1220
Del.quantity cm3/: 0.0...3.0
1000H.: -
2nd speed 1/min: 1180
Del.quantity cm3/: 0.0...15.0
1000H.: -
3rd speed 1/min: 1150
Del.quantity cm3/: 52.5...58.5
1000H.: (49.5...61.5)
4th speed 1/min: 1100
Del.quantity cm3/: 63.5...66.5
1000H.: (62.0...68.0)
5th speed 1/min: 900
Del.quantity cm3/: 65.5...69.5
1000H.: (63.5...71.5)
6th speed 1/min: 750
Del.quantity cm3/: 69.0...70.0
1000H.: (66.5...72.5)
7th speed 1/min: 500
Del.quantity cm3/: 67.5...75.5
1000H.: (65.5...77.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm3/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm3/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm3/: 8.0...14.0
1000H.: (6.0...16.0)
2nd speed 1/min: 520

Del.quantity cm3/: 0.5...4.5
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm3/: -
ind. 1000H: 65.0

2nd speed 1/min: 250
Del.quantity cm3/: -
max. 1000H : 60.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : -
KF mm : 5.0...5.4
MS mm : 1.0...1.4

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W11
Edition : 18.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R367-2
Type number : 0 460 426 165

Customer-specific information
Customer : CDC

Engine : 6BT-5.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.5
mm: $\pm 0.02(0.06)$

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3.8...4.2

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3.6...4.2

Full-load del. w/out charge press.:

Speed 1/min : 750
Del.quantity cm3/
1000H.: 62.0...63.0
Dispersion cm3/: 4.0
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 400
Del.quantity cm3/
1000H.: 6.0...12.0

Full-load speed regulation:

Speed 1/min: 1300
Del.quantity cm3/
1000H: 48.0...54.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 60.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1.6...2.4
mm: (1.3...2.7)
2nd speed 1/min: 750
TD travel mm: 3.8...4.2
mm: (3.3...4.7)
3rd speed 1/min: 1100
TD travel mm: 6.0...6.8
mm: (5.7...7.1)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.4...3.0
2nd speed 1/min: 750
Supply-pump
pressure bar: 3.6...4.2
3rd speed 1/min: 1100
Supply-pump
pressure bar: 5.1...5.7

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1250
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1430
Del.quantity cm3/: 0.0...3.0
1000H.: -
2nd speed 1/min: 1360
Del.quantity cm3/: 15.0...55.0
1000H.: -
3rd speed 1/min: 1300
Del.quantity cm3/: 48.0...54.0
1000H.: (45.0...57.0)
4th speed 1/min: 1250
Del.quantity cm3/: 57.5...60.5
1000H.: (56.0...62.0)
5th speed 1/min: 1100
Del.quantity cm3/: 59.5...63.5
1000H.: (57.5...65.5)
6th speed 1/min: 750
Del.quantity cm3/: 62.0...63.0
1000H.: (59.5...65.5)
7th speed 1/min: 500
Del.quantity cm3/: 56.0...64.0
1000H.: (54.0...66.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250
Del.quantity cm3/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 400
ELAB volt: -
Del.quantity cm3/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
Del.quantity cm3/: 6.0...12.0
1000H.: (4.0...14.0)
2nd speed 1/min: 520
Del.quantity cm3/: 0.5...4.5
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
ind. 1000H: 65.0

2nd speed 1/min: 250
max. 1000H : 60.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5.0...5,4
MS	mm	:	1,0...1,4
SVS max.	mm	:	1.1

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W67
Edition : 22.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R402
Type number : 0 460 426 166

Customer-specific information
Customer : CUM

Engine : 6BTA-590 I

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 1.5
mm: $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900
Charge press. hPa: 1000

Setting value mm: 4.8...5.2

Supply-pump pressure:

Speed 1/min: 900
Charge press. hPa: 1000
Setting value bar: 4.7...5.3

Full-load del. with charge press.:

Speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 71.5...72.5
Dispersion cm³ : 4.0
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 700
Del.quantity cm³/
1000H.: 51.0...52.0

Low-idle speed regulation:

Speed 1/min: 400
Del.quantity cm³/
1000H.: 7.0...13.0
Dispersion cm³ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1180
Charge press. hPa: 1000
Del.quantity cm³/
1000H: 47.0...53.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 75.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750
Charge press. hPa: 1000
TD travel mm: 3.5...4.3
mm: (3.2...4.6)

2nd speed 1/min: 900
Charge press. hPa: 1000
TD travel mm: 4.8...5.2
mm: (4.3...5.5)

3rd speed 1/min: 1100
Charge press. hPa: 1000

TD travel mm: 6.2...7.0
mm: (5.9...7.3)

Supply-pump pressure characteristic:

1st speed 1/min: 750
Charge press. hPa: 1000
Supply-pump pressure bar: 4.0...4.6
2nd speed 1/min: 900
Charge press. hPa: 1000
Supply-pump pressure bar: 4.7...5.3
3rd speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump pressure bar: 5.5...6.1

Overflow quantity at overflow valve:

1st speed 1/min: 750
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 450
Del.quantity cm³/: 64.5...65.5
1000H.: (61.0...69.0)
2nd speed 1/min: 1250
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: -
3rd speed 1/min: 1200
Charge press. hPa: 1000
Del.quantity cm³/: 22.5...37.5
1000H.: -
4th speed 1/min: 1180
Charge press. hPa: 1000
Del.quantity cm³/: 47.0...53.0
1000H.: (44.0...56.0)
5th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/: 59.5...62.5
1000H.: (58.0...64.0)
6th speed 1/min: 900
Charge press. hPa: 1000
Del.quantity cm³/: 61.5...64.5
1000H.: (59.5...66.5)
7th speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/: 71.5...72.5
1000H.: (69.0...75.0)
8th speed 1/min: 700

Charge press. hPa: 450
Del.quantity cm³/: 64.5...65.5
1000H.: (61.0...69.0)
9th speed 1/min: 700
Del.quantity cm³/: 51.0...52.0
1000H.: (47.5...55.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 400
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 400
Del.quantity cm³/: 7.0...13.0
1000H.: (5.0...15.0)
2nd speed 1/min: 500
Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250
Del.quantity cm³/: -
ind. 1000H: 70.0
2nd speed 1/min: 400
Del.quantity cm³/: -
max. 1000H : 45.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5.0...5.4
MS	mm	: 1.3...1.7
SVS max.	mm	: 3.0
XK	mm	: 21.8...23.8
XL	mm	: 12.4...15.8

Remarks:

Operate control lever after each

manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W17
Edition : 18.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1000 R369-1
Type number : 0 460 426 167

Customer-specific information
Customer : CDC

Engine : 6BT-5.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.5
mm: $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750
Setting value mm: 3.5...3.9

Supply-pump pressure:

Speed 1/min: 750
Setting value bar: 3.6...4.2

Full-load del. w/out charge press.:

Speed 1/min : 900
Del.quantity cm³/
1000H.: 73.0...74.0
Dispersion cm³/: 4.0
1000H.: 4.5

Low-idle speed regulation:

Speed 1/min: 500
Del.quantity cm³/
1000H.: 4.0...10.0
Dispersion cm³/: 3.5
1000H.: 7.0

Full-load speed regulation:

Speed 1/min: 1045
Del.quantity cm³/
1000H: 60.0...66.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 70.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500
TD travel mm: 1.4...2.2
mm: (1.1...2.5)
2nd speed 1/min: 750
TD travel mm: 3.5...3.9
mm: (3.3...4.4)
3rd speed 1/min: 1000
TD travel mm: 4.8...5.6
mm: (4.5...5.9)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Supply-pump
pressure bar: 2.6...3.2
2nd speed 1/min: 750
Supply-pump
pressure bar: 3.6...4.2
3rd speed 1/min: 1000

Supply-pump
pressure bar: 4.6...5.2

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1170
Del.quantity cm³/: 0,0...3,0
1000H.: -
2nd speed 1/min: 1100
Del.quantity cm³/: 25.0...45.0
1000H.: -
3rd speed 1/min: 1045
Del.quantity cm³/: 60.0...66.0
1000H.: (57.0...69.0)
4th speed 1/min: 1000
Del.quantity cm³/: 69.5...72.5
1000H.: (69.0...75.0)
5th speed 1/min: 900
Del.quantity cm³/: 72.0...73.0
1000H.: (70.5...76.5)
6th speed 1/min: 750
Del.quantity cm³/: 74.0...78.0
1000H.: (72.0...80.0)
7th speed 1/min: 500
Del.quantity cm³/: 58.5...66.5
1000H.: (56.5...68.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1000
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 500
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

Mfg. date: until : -
1st speed 1/min: 500
Del.quantity cm³/: 4.0...10.0
1000H.: (2.0...12.0)
2nd speed 1/min: 540
Del.quantity cm³/: 0.0...3.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
Del.quantity cm³/: -
ind. 1000H: 80,0

2nd speed 1/min: 250
Del.quantity cm³/: -
max. 1000H : 60

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5.2
MS	mm	:	1.0
SVS max.	mm	:	1.2
FH	mm	:	-
XK	mm	:	18.8...20.8
XL	mm	:	9.9...13.3

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W66
Edition : 22.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R387-1
Type number : 0 460 426 173

Customer-specific information
Customer : CUM

Engine : 6BT-5.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 1.6
mm: $\pm 0.02(0.06)$
Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000
Charge press. hPa: 1000

Setting value mm: 1.8...2.2

Supply-pump pressure:

Speed 1/min: 1000
Charge press. hPa: 1000
Setting value bar: 7.4...8.0

Full-load del. with charge press.:

Speed 1/min: 900
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 67.5...68.5
Dispersion cm³/ : 4.0
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 600
Del.quantity cm³/
1000H.: 56.0...57.0
Dispersion cm³/ : 9.0
1000H.: (9.0)

Low-idle speed regulation:

Speed 1/min: 340
Del.quantity cm³/
1000H.: 10.0...12.0
Dispersion cm³/ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1170
Charge press. hPa: 1000
Del.quantity cm³/
1000H: 44.5...50.5

Start:

Speed 1/min: 100
Del.quantity : -
mind cm³/1000H.: 65.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 900
Charge press. hPa: 1000
TD travel mm: 0.7...1.5
mm: (0.4...1.8)
2nd speed 1/min: 1000
Charge press. hPa: 1000
TD travel mm: 1.8...2.2
mm: (1.3...2.7)

3rd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 2.4...3.2
mm: (2.1...3.5)

Supply-pump pressure characteristic:

1st speed 1/min: 600
Charge press. hPa: 1000
Supply-pump pressure bar: 5.7...6.3
2nd speed 1/min: 900
Charge press. hPa: 1000
Supply-pump pressure bar: 7.1...7.7
3rd speed 1/min: 1000
Charge press. hPa: 1000
Supply-pump pressure bar: 7.4...8.0
4th speed 1/min: 1100
Charge press. hPa: 1000
Supply-pump pressure bar: 7.9...8.5

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1100
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 400
Del.quantity cm³/: 66.0...67.0
1000H.: (62.5...70.5)
2nd speed 1/min: 1280
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: -
3rd speed 1/min: 1230
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...15.0
1000H.: -
4th speed 1/min: 1200
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: -
5th speed 1/min: 1170
Charge press. hPa: 1000
Del.quantity cm³/: 44.5...50.5
1000H.: (41.5...53.5)
6th speed 1/min: 1100
Charge press. hPa: 1000

Del.quantity cm³/: 64.5...67.5
1000H.: (63.0...69.0)
7th speed 1/min: 900
Charge press. hPa: 1000
Del.quantity cm³/: 67.5...68.5
1000H.: (65.0...71.0)
8th speed 1/min: 750
Charge press. hPa: 1000
Del.quantity cm³/: 69.0...73.0
1000H.: (67.0...75.0)
9th speed 1/min: 700
Charge press. hPa: 400
Del.quantity cm³/: 66.0...67.0
1000H.: (62.5...70.5)
10th speed 1/min: 600
Del.quantity cm³/: 56.0...57.0
1000H.: (52.5...60.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 340
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 340
Del.quantity cm³/: 10...12.0
1000H.: (6.0...16.0)
2nd speed 1/min: 450
Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 350
Del.quantity cm³/: -
ind. 1000H: 70.0
2nd speed 1/min: 480
Del.quantity cm³/: -
max. 1000H : 70.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5.0...5.4
MS	mm	:	1.3...1.7
SVS max.	mm	:	1.0
XK	mm	:	21.8...23.8
XL	mm	:	10.2...13.6

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W63
Edition : 20.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1300 R377-1
Type number : 0 460 426 174

Customer-specific information
Customer : CUM

Engine : 6BT 5.9 A

TEST BENCH REQUIREMENTS

Calibrating oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm : 2.35
mm : $\pm 0.02(0.06)$

Outlet : D

Injection pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 850
Charge press. hPa: 1000

Setting value mm: 2.6...3.0

Supply-pump pressure:

Speed 1/min: 850
Charge press. hPa: 1000
Setting value bar: 6.6...7.2

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 73.5...74.5
Dispersion cm³ : 4.0
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 50.5...51.5
Dispersion cm³/: 9.0
1000H.: (9.0)

Low-idle speed regulation:

Speed 1/min: 350
Del.quantity cm³/
1000H.: 9.0...11.0
Dispersion cm³/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1400
Charge press. hPa: 1000
Del.quantity cm³/
1000H: 54.0...60.0

Start:

Speed 1/min: 100
mind cm³/1000H.: 60.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 700
Charge press. hPa: 1000
TD travel mm: 1.4...2.2
mm: (1.1...2.5)

2nd speed 1/min: 850
Charge press. hPa: 1000
TD travel mm: 2.6...3.0
mm: (2.1...3.5)

3rd speed 1/min: 1300

Charge press. hPa: 1000
TD travel mm: 2.9...3.7
mm: (2.6...4.0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 4.8...5.4
2nd speed 1/min: 850
Charge press. hPa: 1000
Supply-pump pressure bar: 6.6...7.2
3rd speed 1/min: 1300
Charge press. hPa: 1000
Supply-pump pressure bar: 8.6...9.2

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1300
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 475
Del.quantity cm³/: 63.0...64.0
1000H.: (59.5...67.5)
2nd speed 1/min: 1600
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: -
3rd speed 1/min: 1480
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: -
4th speed 1/min: 1400
Charge press. hPa: 1000
Del.quantity cm³/: 54.0...60.0
1000H.: (51.0...63.0)
5th speed 1/min: 1300
Charge press. hPa: 1000
Del.quantity cm³/: 65.0...68.0
1000H.: (63.5...69.5)
6th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/: 69.5...72.5
1000H.: (67.5...74.5)
7th speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm³/: 73.5...74.5
1000H.: (71.0...77.0)

8th speed 1/min: 700
Charge press. hPa: 475
Del.quantity cm³/: 63.0...64.0
1000H.: (59.5...67.5)
9th speed 1/min: 500
Del.quantity cm³/: 50.5...51.5
1000H.: (47.0...55.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1300
Del.quantity cm³/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 350
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 350
Del.quantity cm³/: 9.0...11.0
1000H.: (5.0...15.0)
2nd speed 1/min: 450
Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250
ind. 1000H: 50.0
2nd speed 1/min: 400
max. 1000H : 60.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : -
MS mm : 1.2...1.6
SVS max. mm : 2.2

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket



BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W64
Edition : 20.06.90
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 6/12F1400 R377-2
Type number : 0 460 426 175

Customer-specific information
Customer : CUM

Engine : 6BT 5.9 A

Power k: 107
Speed 1/mi: 2800

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 250...253

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): $\pm 0.02(0.04)$

Start of delivery block
Piston stroke mm: 2.35
mm: $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000
Charge press. hPa: 1000
Setting value mm: 2.2...2.6

Supply-pump pressure:

Speed 1/min: 1000
Charge press. hPa: 1000
Setting value bar: 7.1...7.7

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 57.0...58.0
Dispersion cm³ / : 4.0
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm³/
1000H.: 44.5...45.5
Dispersion cm³ / : 9.0
1000H.: (9.0)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm³/
1000H.: 6.5...10.5
Dispersion cm³ / : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1520
Charge press. hPa: 1000
Del.quantity cm³/
1000H.: 41.0...47.0

Start:

Speed 1/min: 100
mind cm³/1000H.: 50.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 850
Charge press. hPa: 1000
TD travel mm: 1.0...1.8
mm: (0.7...2.1)
2nd speed 1/min: 1000
Charge press. hPa: 1000

TD travel mm: 2.2...2.6
mm: (1.7...3.1)
3rd speed 1/min: 1400
Charge press. hPa: 1000
TD travel mm: 2.9...3.7
mm: (2.6...4.0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 4.7...5.3
2nd speed 1/min: 1000
Charge press. hPa: 1000
Supply-pump pressure bar: 7.1...7.7
3rd speed 1/min: 1400
Charge press. hPa: 1000
Supply-pump pressure bar: 8.9...9.5

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1400
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 300
Del.quantity cm³/: 50.0...51.0
1000H.: (46.5...54.5)
2nd speed 1/min: 1680
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: -
3rd speed 1/min: 1590
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: -
4th speed 1/min: 1520
Charge press. hPa: 1000
Del.quantity cm³/: 41.0...47.0
1000H.: (38.0...50.0)
5th speed 1/min: 1400
Charge press. hPa: 1000
Del.quantity cm³/: 57.5...61.5
1000H.: (56.0...62.0)
6th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/: 58.0...61.0
1000H.: (56.0...63.0)
7th speed 1/min: 850

Charge press. hPa: 1000
Del.quantity cm³/: 57.0...58.0
1000H.: (54.5...60.5)
8th speed 1/min: 700
Charge press. hPa: 300
Del.quantity cm³/: 50.0...51.0
1000H.: (46.5...54.5)
9th speed 1/min: 500
Del.quantity cm³/: 44.5...45.5
1000H.: (41.0...49.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 6.5...10.5
1000H.: (3.5...13.5)
2nd speed 1/min: 450
Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 230
ind. 1000H: 65.0
2nd speed 1/min: 400
max. 1000H: 65.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : -
MS mm : 1.0...1.4
SVS max. mm : 2.2

Remarks:

Operate control lever after each manifold-pressure compensator pressure

change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket



BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W65
Edition : 20.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1400 R377-3
Type number : 0 460 426 176

Customer-specific information
Customer : CUM

Engine : 6BT 5.9 A

Power k: 114
Speed 1/mi: 2800

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 0.35

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery
Prestroke mm : 0.3
(from BDC): +0.02(0.04)

Start of delivery block
Piston stroke mm: 2.25
mm: +0.02(0.06)

Outlet : 0

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000
Charge press. hPa: 1000
Setting value mm: 1.8...2.2

Supply-pump pressure:

Speed 1/min: 1000
Charge press. hPa: 1000
Setting value bar: 5.8...6.4

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 56.5...57.5
Dispersion cm3/ : 4.0
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 50.0...51.0
Dispersion cm3/ : 9.0
1000H.: (9.0)

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 5.0...9.0
Dispersion cm3/ : 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1520
Charge press. hPa: 1000
Del.quantity cm3/
1000H: 47.5...53.5

Start:

Speed 1/min: 100
mind cm3/1000H.: 55.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 850
Charge press. hPa: 1000
TD travel mm: 0.5...1.3
mm: (0.2...1.6)

2nd speed 1/min: 1000
Charge press. hPa: 1000

TD travel mm: 1.8...2.2
mm: (1.3...2.7)
3rd speed 1/min: 1400
Charge press. hPa: 1000
TD travel mm: 2.9...3.7
mm: (2.6...4.0)

Supply-pump pressure characteristic:

1st speed 1/min: 500
Charge press. hPa: 1000
Supply-pump pressure bar: 3.4...4.0
2nd speed 1/min: 1000
Charge press. hPa: 1000
Supply-pump pressure bar: 5.8...6.4
3rd speed 1/min: 1400
Charge press. hPa: 1000
Supply-pump pressure bar: 7.5...8.1

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 1400
Charge press. hPa: 1000
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700
Charge-air pressure-setting point hPa: 350
Del.quantity cm³/: 56.5...57.5
1000H.: (53.0...61.0)
2nd speed 1/min: 1700
Charge press. hPa: 1000
Del.quantity cm³/: 0.0...3.0
1000H.: -
3rd speed 1/min: 1600
Charge press. hPa: 1000
Del.quantity cm³/: 15.0...55.0
1000H.: -
4th speed 1/min: 1520
Charge press. hPa: 1000
Del.quantity cm³/: 47.5...53.5
1000H.: (44.5...56.5)
5th speed 1/min: 1400
Charge press. hPa: 1000
Del.quantity cm³/: 60.0...63.0
1000H.: (58.5...64.5)
6th speed 1/min: 1100
Charge press. hPa: 1000
Del.quantity cm³/: 62.0...64.0
1000H.: (60.0...67.0)
7th speed 1/min: 850

Charge press. hPa: 1000
Del.quantity cm³/: 61.5...62.5
1000H.: (59.0...65.0)
8th speed 1/min: 700
Charge press. hPa: 350
Del.quantity cm³/: 56.5...57.5
1000H.: (53.0...61.0)
9th speed 1/min: 500
Del.quantity cm³/: 50.0...51.0
1000H.: (46.5...54.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400
Del.quantity cm³/: 0...3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375
Del.quantity cm³/: 5.0...9.0
1000H.: (2.0...12.0)
2nd speed 1/min: 450
Del.quantity cm³/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 270
ind. 1000H: 65.0
2nd speed 1/min: 400
max. 1000H : 75.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm : -
MS mm : 0.6...1.0
SVS max. mm : 2.0

Remarks:

Operate control lever after each manifold-pressure compensator pressure

change.

* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W56
 Edition : 19.06.90
 Calibrating oil : ISO 4113
 Injection pump : VE 6/12F1050 R372-1
 Type number : 0 460 426 178
 Customer-specific information
 Customer : CUM
 Engine : 6BT-5.9 IND.

TEST BENCH REQUIREMENTS

Calibrating-oil
 return temp. °C
 with thermometer : 40...48
 electronically : 42...50
 Inlet press., bar : 0.35
 Calibrating nozzle-holder
 assembly : 1 688 901 016
 Opening
 pressure bar : 207...210
 Perforated-plate
 diameter mm : 0.5
 Test inj. tubing : 1 680 750 017
 Outside diameter : 6.0
 x Wall thickness : 2.0
 x Length mm : 840.0
 Start of delivery
 Prestroke mm : 0.3
 (from BDC): +0.02(0.04)
 Start of delivery block
 Piston stroke mm: 1.5
 mm: +0.02(0.06)
 Outlet : 0
 Injection-pump setting values
 Test specifications in parentheses
 Timing-device travel:
 Speed 1/min: 750
 Setting value mm: 2.4...2.8

Supply-pump pressure:

Speed 1/min: 750
 Setting value bar: 2.9...3.5
 Full-load del. w/out charge press.:
 Speed 1/min : 900
 Del.quantity cm3/
 1000H.: 76.0...77.0
 Dispersion cm3/: 4.0
 1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375
 Del.quantity cm3/
 1000H.: 27.0...33.0
 Dispersion cm3/: 3.5
 1000H.: (4.5)

Full-load speed regulation:

Speed 1/min: 1150
 Del.quantity cm3/
 1000H: 26.0...34.0

Start:

Speed 1/min: 100
 mind cm3/1000H.: 110.0

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600
 TD travel mm: 0.9...1.7
 mm: (0.6...2.0)
 2nd speed 1/min: 750
 TD travel mm: 2.4...2.8
 mm: (1.9...2.3)
 3rd speed 1/min: 900
 TD travel mm: 3.5...4.3
 mm: (3.2...4.6)

Supply-pump pressure characteristic:

1st speed 1/min: 500
 Supply-pump
 pressure bar: 1.9...2.5
 2nd speed 1/min: 750
 Supply-pump
 pressure bar: 2.9...3.5
 3rd speed 1/min: 900
 Supply-pump
 pressure bar: 3.5...4.1

Overflow quantity at overflow valve:

1st speed 1/min: 500
Overflow : 41...83
quantity cm3/10s: (26...98)
2nd speed 1/min: 1050
Overflow : 55...138
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200
Del.quantity cm3/: 0.0...3.0
1000H.: -
2nd speed 1/min: 1150
Del.quantity cm3/: 26.0...34.0
1000H.: (24.0...36.0)
3rd speed 1/min: 1050
Del.quantity cm3/: 72.0...75.0
1000H.: (70.5...76.5)
4th speed 1/min: 900
Del.quantity cm3/: 76.0...77.0
1000H.: (73.5...79.5)
5th speed 1/min: 750
Del.quantity cm3/: 78.5...82.5
1000H.: (76.5...84.5)
6th speed 1/min: 500
Del.quantity cm3/: 93.5...97.5
1000H.: (91.0...100.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050
Del.quantity cm3/: 0..3
1000H.: -

Electr. shutoff:

Speed 1/min: 375
ELAB volt: -
Del.quantity cm3/: 0.0...3.0
max. 1000H.: -

Idle delivery:

Mfg. date: until : -
1st speed 1/min: 375
Del.quantity cm3/: 27...33.0
1000H.: (25...35.0)
2nd speed 1/min: 450
Del.quantity cm3/: 0.0...4.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130
ind. 1000H: 110.0

2nd speed 1/min: 200
max. 1000H : 105.0

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5.0...5.4
MS	mm	: 1.3...1.7
XK	mm	: 18.8...20.8
XL	mm	: 11.1...14.5

Remarks:

Heavy-duty fuel-injection pump for
DI-engines: only test using timing-
device-travel measuring device with
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE 1.5 C
Edition : 22.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2500 R305
Type number : 9 460 620 002
Customer Part-No. : 8 944 60 8050

Customer-specific information
Customer : OPE

Engine : 4EC1-AADT

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...52

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 450.0

Start of delivery
Prestroke mm : -
(from BDC): -

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Charge press. hPa: 700
Setting value mm: 2.8...3.2

Supply-pump pressure:

Speed 1/min: 1250
Charge press. hPa: 700
Setting value bar: 3.8...4.4

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 700
Del.quantity cm3/
1000H.: 43.6...44.6
Dispersion cm3/ : -
1000H : (2.5)

Full-load del. w/out charge press.:

Speed 1/min : 600
Del.quantity cm3/
1000H.: 33.0...37.0

Low-idle speed regulation:

Speed 1/min: 425
Del.quantity cm3/
1000H.: 6.9...10.9
Dispersion cm3/ : 2.5
1000H.: (3.0)

Full-load speed regulation:

Speed 1/min: 2750
Charge press. hPa: 700
Del.quantity cm3/
1000H: 16.9...22.9

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 44.0

Load-dependent start of delivery:

Speed 1/min: 1250
Charge press. hPa: 700

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 620
Charge press. hPa: 700
TD travel mm: 0.3...1.1
mm: (0.0...1.4)
2nd speed 1/min: 1250
Charge press. hPa: 700
TD travel mm: 2.8...3.2
mm: (2.3...3.7)
3rd speed 1/min: 2000

Charge press. hPa: 700
TD travel mm: 5.6...6.4
mm: (5.3...6.7)
4th speed 1/min: 2250
Charge press. hPa: 700
TD travel mm: 6.6...7.4
mm: (6.3...7.7)

Supply-pump pressure characteristic:

1st speed 1/min: 620
Charge press. hPa: 700
Supply-pump pressure bar: 2.2...2.8
2nd speed 1/min: 1250
Charge press. hPa: 700
Supply-pump pressure bar: 3.8...4.4
3rd speed 1/min: 2250
Charge press. hPa: 700
Supply-pump pressure bar: 6.2...6.8

Overflow quantity at overflow valve:

1st speed 1/min: 600
Overflow : 41...83
quantity cm³/10s: (26...98)
2nd speed 1/min: 2500
Charge press. hPa: 700
Overflow : 55...138
quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1000
Charge-air pressure-setting point hPa: 340
Del.quantity cm³/: 39.8...40.8
1000H.: (37.8...42.8)
2nd speed 1/min: 2750
Charge press. hPa: 700
Del.quantity cm³/: 16.9...22.9
1000H.: (15.9...23.9)
3rd speed 1/min: 2750
Charge press. hPa: 700
Del.quantity cm³/: 0.0...3.0
1000H.: -
4th speed 1/min: 2600
Charge press. hPa: 700
Del.quantity cm³/: 26.1...34.1
1000H.: -
5th speed 1/min: 2500
Charge press. hPa: 700
Del.quantity cm³/: 37.0...40.0
1000H.: (36.2...40.8)
6th speed 1/min: 2300
Charge press. hPa: 700
Del.quantity cm³/: 40.4...43.4
1000H.: (39.7...44.1)

7th speed 1/min: 2000
Charge press. hPa: 700
Del.quantity cm³/: 40.5...43.5
1000H.: (40.0...44.0)
8th speed 1/min: 1500
Charge press. hPa: 700
Del.quantity cm³/: 43.6...44.6
1000H.: (41.8...46.4)
9th speed 1/min: 1500
Del.quantity cm³/: 30.4...34.4
1000H.: (29.9...34.9)
10th speed 1/min: 1300
Charge press. hPa: 700
Del.quantity cm³/: 44.1...47.1
1000H.: (43.6...47.6)
11th speed 1/min: 1000
Charge press. hPa: 340
Del.quantity cm³/: 39.8...40.8
1000H.: (37.8...42.8)
1st speed 1/min: 600
Del.quantity cm³/: 33.0...37.0
1000H.: (32.0...38.0)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 425
ELAB volt: -
Del.quantity cm³/: 0.0...3.0
max. 1000H.: -

Idle delivery:

1st speed 1/min: 425
Del.quantity cm³/: 6.9...10.9
1000H.: (4.9...12.9)
2nd speed 1/min: 550
Del.quantity cm³/: 0.0...3.0
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 100
Del.quantity cm³/: -
ind. 1000H.: 44.0
2nd speed 1/min: 400
Del.quantity cm³/: -
max. 1000H.: 42.5

Shutoff electromagnet:

Cut-in
min. voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	-
MS	mm	:	-
SVS max.	mm	:	-

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE 1.5 D
Edition : 22.06.90
replaces : -
Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2500 R341
Type number : 9 460 620 003
Customer Part-No. : 8 943 32 9740

Customer-specific information
Customer : OPE

Engine : 4EC1-BADT

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 022

Opening
pressure bar : 130...133

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 450.0

Start of delivery
Prestroke mm : -
(from BDC): -

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250
Charge press. hPa: 700
Setting value mm: 2.8...3.2

Supply-pump pressure:

Speed 1/min: 1250
Charge press. hPa: 700
Setting value bar: 3.8...4.4

Full-load del. with charge press.:

Speed 1/min: 1500
Charge press. hPa: 700
Del.quantity cm3/
1000H.: 46.9...47.9
Dispersion cm3/ : -
1000H : (2.5)

Full-load del. w/out charge press.:

Speed 1/min : 600
Del.quantity cm3/
1000H.: 33.8...37.8

Low-idle speed regulation:

Speed 1/min: 425
Del.quantity cm3/
1000H.: 6.9...10.9
Dispersion cm3/ : 2.5
1000H.: (3.0)

Full-load speed regulation:

Speed 1/min: 2750
Charge press. hPa: 700
Del.quantity cm3/
1000H: 19.6...25.6

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 38.0

Load-dependent start of delivery:

Speed 1/min: 1250
Charge press. hPa: 700

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 620
Charge press. hPa: 700
TD travel mm: 0.3...1.1
mm: (0.0...1.4)
2nd speed 1/min: 1250
Charge press. hPa: 700
TD travel mm: 2.8...3.2
mm: (2.3...3.7)
3rd speed 1/min: 2000

Charge press. hPa: 700
 TD travel mm: 5.6...6.4
 mm: (5.3...6.7)
 4th speed 1/min: 2250
 Charge press. hPa: 700
 TD travel mm: 6.6...7.4
 mm: (6.3...7.7)

Supply-pump pressure characteristic:

1st speed 1/min: 620
 Charge press. hPa: 700
 Supply-pump pressure bar: 2.2...2.8
 2nd speed 1/min: 1250
 Charge press. hPa: 700
 Supply-pump pressure bar: 3.8...4.4
 3rd speed 1/min: 2250
 Charge press. hPa: 700
 Supply-pump pressure bar: 6.2...6.8

Overflow quantity at overflow valve:

1st speed 1/min: 600
 Overflow : 41...83
 quantity cm³/10s: (26...98)
 2nd speed 1/min: 2500
 Charge press. hPa: 700
 Overflow : 55...138
 quantity cm³/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1000
 Charge-air pressure-setting point hPa: 340
 Del.quantity cm³/: 43.3...44.3
 1000H.: (41.3...46.3)
 2nd speed 1/min: 2950
 Charge press. hPa: 700
 Del.quantity cm³/: 0.0...15.0
 1000H.: -
 3rd speed 1/min: 2750
 Charge press. hPa: 700
 Del.quantity cm³/: 19.6...25.6
 1000H.: (18.6...26.6)
 4th speed 1/min: 2600
 Charge press. hPa: 700
 Del.quantity cm³/: 26.1...34.1
 1000H.: -
 5th speed 1/min: 2500
 Charge press. hPa: 700
 Del.quantity cm³/: 34.1...37.1
 1000H.: (33.3...37.9)
 6th speed 1/min: 2300
 Charge press. hPa: 700
 Del.quantity cm³/: 44.5...47.5
 1000H.: (43.8...48.2)

7th speed 1/min: 2000
 Charge press. hPa: 700
 Del.quantity cm³/: 44.3...47.3
 1000H.: (43.8...47.8)
 8th speed 1/min: 1500
 Charge press. hPa: 700
 Del.quantity cm³/: 46.9...47.9
 1000H.: (45.1...49.7)
 9th speed 1/min: 1500
 Del.quantity cm³/: 34.6...38.6
 1000H.: (34.1...39.1)
 10th speed 1/min: 1300
 Charge press. hPa: 700
 Del.quantity cm³/: 46.1...49.1
 1000H.: (45.6...49.6)
 11th speed 1/min: 1000
 Charge press. hPa: 340
 Del.quantity cm³/: 43.3...44.5
 1000H.: (41.3...46.5)
 1st speed 1/min: 600
 Del.quantity cm³/: 33.8...37.8
 1000H.: (32.8...38.8)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 425
 ELAB volt: -
 Del.quantity cm³/: 0.0...3.0
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 425
 Del.quantity cm³/: 6.9...10.9
 1000H.: (4.9...12.9)
 2nd speed 1/min: 550
 Del.quantity cm³/: 0.0...5.0
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 100
 Del.quantity cm³/: -
 ind. 1000H.: 38.0

2nd speed 1/min: 400
 Del.quantity cm³/: -
 max. 1000H.: 57.5

Shutoff electromagnet:

Cut-in
 min. voltage : 10.0
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	-
MS	mm	:	-
SVS max.	mm	:	-

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut (46)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 3,0 b 2
Edition : 02.05.90
Replaces : 15.8.89
Test oil : ISO-4113

Combination no. : 0 400 473 088

Injection pump
Pump designation : PES3A80D410RS1324-2
EP type number : 0 410 483 025
Governor
Governor design. : RSV325...900A7C602-1
L
Governor no. : 0 420 232 388

Customer-spec. information
Customer : KHD

Engine : F3L912

1st version kW : 60.0
Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00
: (1.85...2.05)

Rack travel in mm : 9.00...12.00
Firing order : 1- 3- 2

Phasing : 0-120-240

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 880

Rack travel in mm : 11.60...11.70

Del.quantity cm3/ : 4.6...4.7

100 s: (4.5...4.9)

Spread cm3 : 0.2

100 s: (0.4)

2nd speed rpm : 325.0

Rack travel in mm : 8.9...9.1

Del.quantity cm3/ : 0.7...1.3

100 s: (0.5...1.4)

Spread cm3 : 0.2

100 s: (0.3)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 880

Del.quantity : 46.5...47.5

1000 : (45.0...49.0)

Spread cm3 : 2.50

1000 : (4.00)

RATED SPEED

1st version

Control lever

position degrees: 100...108

Testing:

1st rack travel in: 10.60

Speed rpm : 920...930

2nd rack travel in: 4.00

Speed rpm : 935...965
3rd rack travel in: 4.00
Speed rpm : 955...985
4th rack travel in: 1145
Speed rpm : 0.30...1.40

Generator set

LOW IDLE 1
Control lever
position degrees: 68...76
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 6.5

Testing:
Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 325
Rack travel in mm : 6.90...7.10
Rack travel in mm : 2.00
Speed rpm : 475...535

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 880
Rack travel in m: 11.60...11.70
2nd speed rpm : 500
Rack travel in m: 13.00...13.10
3rd speed rpm : 700
Rack travel in m: 12.20...12.30

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 700
Del.quantity cm³/ : 49.5...51.5
1000 s: (47.5...53.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.60
Speed rpm : 920...930

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 115.0...125.0
1000 s: (112.0...128.0)
Rack travel in mm : 19.50...21.00

Remarks:

:

APPLICATION

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 19,0 n4
 Edition : 06.07.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 640 115
 Injection pump
 Pump designation : PE12A95D61OLS2590
 EP type number : 0 410 690 995
 Governor
 Governor design. : RQV300...1000AB1047-
 1L
 Governor no. : 0 420 212 223

Customer-spec. information
 Customer : KHD

Engine : F12L413FW

1st version kW : 182.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60
 : (1.45...1.65)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 4- 9- 8- 5- 2-
 11- 10- 3- 6- 7- 12

Phasing : 0-15-60-75-120-135-
 180-195-240-255-300-
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.00...10.10

Del.quantity cm3/ : 7.9...8.1

100 s: (7.7...8.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.20...1.30

2nd speed rpm : 340

travel mm : 1.80...1.90

3rd speed rpm : 390

travel mm : 2.40...2.50

4th speed rpm : 1050

travel mm : 8.70...8.90

5th speed rpm : 1110

travel mm : 9.50...9.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1015

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 79.0...81.0

1000 : (77.0...83.0)

Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 116...124

Testing:
1st rack travel in: 9.00
Speed rpm : 1040...1050
2nd rack travel in: 4.00
Speed rpm : 1085...1115

LOW IDLE 1
Control lever
position degrees: 82...90

Testing:
Speed rpm : 200
Minimum rack travel: 9.00
Speed rpm : 300
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION
Speed rpm : 300...450

TORQUE CONTROL
Dimension a mm : 0.40
Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 10.00...10.10
2nd speed rpm : 800
Rack travel in m: 10.40...10.50
3rd speed rpm : 900
Rack travel in m: 10.20...10.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 100
Del.quantity cm3/ : 65.0...70.0
1000 s: (62.5...72.5)
Speed rpm : 800
Del.quantity cm3/ : 82.5...85.5
1000 s: (80.0...88.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.00

F03

Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 120.0...130.0
1000 s: (117.0...133.0)

Remarks:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

2. Set fuel delivery in fuel-delivery
characteristics with stop above the
governor housing.

When accelerating from engine speed
"0", no voltage in starting solenoid.

APPLICATION

Below-ground operation

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 8,7 c 1
 Edition : 20.07.90
 Replaces : 7.85
 Test oil : ISO-4113
 Combination no. : 0 400 646 248
 Injection pump
 Pump designation : PE6A90D410RS2124X
 EP type number : 0 410 696 155
 Governor
 Governor design. : RQ375/1275AB658DL
 Governor no. : 0 420 202 282

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM 360

1st version kW : 125.0
 Rated speed : 2550

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25
 : (2.10...2.30)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 9.30...9.40

Del.quantity cm³/ : 7.7...7.8

100 s: (7.5...8.0)

Spread cm³ : 0.3

100 s: (0.4)

2nd speed rpm : 375.0

Rack travel in mm : 5.9...6.1

Del.quantity cm³/ : 1.0...1.6

100 s: (0.8...1.8)

Spread cm³ : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 700

Rack travel in mm : 15.60...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 77.0...78.0

1000 : (75.0...80.0)

Spread cm³ : 3.00

1000 : (4.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 700

Rack travel in mm : 16.0

Testing:

1st rack travel in: 8.30

Speed rpm : 1295...1310

2nd rack travel in: 4.00

Speed rpm : 1345...1375

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 375

Rack travel in mm : 6.0

Testing:

Speed rpm : 100

Minimum rack trave: 7.50

Speed rpm : 375

Rack travel in mm : 5.90...6.10

Rack travel in mm : 2.00

Speed rpm : 420...460

Speed rpm : 500

Maximum rack trave: 1.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 9.30...9.40

2nd speed rpm : 700

Rack travel in m: 10.10...10.20

3rd speed rpm : 895

Rack travel in m: 9.80...10.00

4th speed rpm : 1075

Rack travel in m: 9.40...9.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700

Del.quantity cm³/ : 77.0...80.0

1000 s: (75.0...82.0)

RACK STOP ADJUSTMENT

Speed rpm : 650

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.30

Speed rpm : 1295...1310

STARTING FUEL DELIVERY

Speed rpm : 100

Rack travel in mm : 15.20...17.80

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 9,6 n 1
 Edition : 06.07.90
 Replaces : 5.2.88
 Test oil : ISO-4113
 Combination no. : 0 400 646 266
 Injection pump
 Pump designation : PE6A95D410LS2587
 EP type number : 0 410 696 983
 Governor
 Governor design. : RQV300...1150AB1088L
 Governor no. : 0 420 212 115

Customer-spec. information
 Customer : KHD

Engine : F6L413 FW

1st version kW : 102.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60
 : (1.45...1.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 9.60...9.70

Del.quantity cm3/ : 7.8...8.0

100 s: (7.6...8.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.10...1.60

2nd speed rpm : 390

travel mm : 2.20...2.60

3rd speed rpm : 1195

travel mm : 8.70...9.10

4th speed rpm : 1245

travel mm : 9.40...9.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1170

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 78.0...80.0

1000 : (76.0...82.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 117...125

Testing:
1st rack travel in: 8.60
Speed rpm : 1190...1200
2nd rack travel in: 4.00
Speed rpm : 1230...1260
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 67...75

Testing:
Speed rpm : 200
Minimum rack travel: 8.40
Speed rpm : 300
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION
Speed rpm : 300...420

TORQUE CONTROL
Dimension a mm : 0.70
Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 9.60...9.70
2nd speed rpm : 500
Rack travel in m: 10.30...10.50
3rd speed rpm : 925
Rack travel in m: 10.10...10.30
4th speed rpm : 1030
Rack travel in m: 9.60...9.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 100
Del.quantity cm³/ : 65.0...70.0
1000 s: (62.5...72.5)
Speed rpm : 800
Del.quantity cm³/ : 80.5...83.5
1000 s: (78.0...86.0)

RACK STOP ADJUSTMENT

Speed rpm : 500

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 8.60
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 120.0...130.0
1000 s: (117.0...133.0)
Rack travel in mm : 15.40...15.80

Remarks:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

2. Set fuel delivery in fuel-delivery
characteristics with stop above the
governor housing.

When accelerating from engine speed
"0", no voltage in starting solenoid.

APPLICATION

Below-ground operation

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 8,3 k 2
Edition : 21.05.90
Replaces : 15.12.89
Test oil : ISO-4113

Combination no. : 0 400 646 268

Injection pump
Pump designation : PE6A95D410RS2525
EP type number : 0 410 696 987
Governor
Governor design. : RQ225/1200AB1156L
Governor no. : 0 420 200 079

Customer-spec. information
Customer : DAF

Engine : DH 825

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
: (1.95...2.15)

Rack travel in mm : 7.50...10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
& maximum rack tra: 21.00
Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.40...10.50

Del.quantity cm3/ : 7.3...7.4

100 s: (7.1...7.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 225.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 650

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 73.5...74.5

1000 : (71.5...76.5)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 650

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.40

Speed rpm : 1245...1260

2nd rack travel in: 4.00
Speed rpm : 1300...1330
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 225
Rack travel in mm : 6.0

Testing:

Speed rpm : 100
Minimum rack trave: 7.50
Speed rpm : 225
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 345...385
Speed rpm : 490
Maximum rack trave: 1.00

TORQUE CONTROL

Dimension a mm : 0.50
Torque control curve - 1st version
1st speed rpm : 1200
Rack travel in m: 10.40...10.50
2nd speed rpm : 650
Rack travel in m: 11.70...11.80
4th speed rpm : 1035
Rack travel in m: 10.90...11.10
5th speed rpm : 1100
Rack travel in m: 10.50...10.80

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800
Del.quantity cm3/ : 74.5...77.5
1000 s: (72.0...80.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...140.0
1000 s: (127.0...143.0)
Rack travel in mm : 19.50...21.00

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 12,7 p5
 Edition : 17.05.90
 Replaces : 28.4.89
 Test oil : ISO-4113
 Combination no. : 0 400 648 111
 Injection pump
 Pump designation : PE8A95D410LS2608
 EP type number : 0 410 698 988
 Governor
 Governor design. : RQ300/1250AB987DL
 Governor no. : 0 420 202 277

Customer-spec. information
 Customer : KHD

Engine : F8L413F

1st version kW : 188.0
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
 : (1.95...2.15)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-
 4- 3

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.40...10.50

Del.quantity cm3/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.5...6.7

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.5

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.60...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 96.5...98.5

1000 : (94.5...100.5)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 16.0

Testing:

1st rack travel in: 9.40

Speed rpm : 1295...1310

2nd rack travel in: 4.00

Speed rpm : 1335...1365

4th rack travel in: 1450
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.0

Testing:

Speed rpm : 100

Minimum rack trave: 7.50

Speed rpm : 300

Rack travel in mm : 5.90...6.10

Rack travel in mm : 2.00

Speed rpm : 345...385

Speed rpm : 550

Maximum rack trave: 1.00

TORQUE CONTROL

Dimension a mm : 0.25

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 10.40...10.50

2nd speed rpm : 550

Rack travel in m: 10.90...11.00

3rd speed rpm : 850

Rack travel in m: 10.60...10.80

4th speed rpm : 970

Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650

Del.quantity cm3/ : 95.0...98.0

1000 s: (92.5...100.5)

RACK STOP ADJUSTMENT

Speed rpm : 600

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40

Speed rpm : 1295...1310

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 125.0...140.0

1000 s: (122.0...143.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

F11

Speed rpm : 300
Rack travel in mm : 6.50...6.70
Del.quantity cm3/ : 9.0...15.0
1000 s: (6.5...17.5)
Spread cm3 : 5.50
1000 s: (7.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 12,7 p7
 Edition : 11.05.89
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 648 112
 Injection pump
 Pump designation : PE8A95D410LS2608
 EP type number : 0 410 698 988
 Governor
 Governor design. : RQV300...1250AB990DL
 Governor no. : 0 420 214 228

Customer-spec. information
 Customer : KHD

Engine : F8L413F

1st version kW : 188.0
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
 : (1.95...2.15)
 Rack travel in mm : 9.00...12.00

F12

Firing order : 1- 8- 7- 2- 6- 5-
 4- 3

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 9.90...10.00

Del.quantity cm3/ : 9.1...9.3

100 s: (8.9...9.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0
 Rack travel in mm : 6.2...6.3
 Del.quantity cm3/ : 1.1...1.7
 100 s: (0.8...1.9)

Spread cm3 : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1290

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 91.5...93.5

1000 : (89.5...95.5)

Spread cm3 : 3.00

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 57...65

Setting point:

Speed rpm : 1290

Rack travel in mm : 16.5

Testing:

1st rack travel in: 8.90

Speed rpm : 1290...1300

2nd rack travel in: 4.00
Speed rpm : 1360...1390
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 8...16
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.2

Testing:
Speed rpm : 100
Minimum rack trave: 7.70
Speed rpm : 300
Rack travel in mm : 6.20...6.30
Speed rpm : 950
Maximum rack trave: 1.00

CONSTANT REGULATION
Speed rpm : 320...440

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1250
Rack travel in m: 9.90...10.00
2nd speed rpm : 1075
Rack travel in m: 9.90...10.20
3rd speed rpm : 925
Rack travel in m: 10.20...10.40
4th speed rpm : 500
Rack travel in m: 10.40...10.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 1000
Del.quantity cm3/ : 91.0...94.0
1000 s: (89.0...96.0)
Speed rpm : 700
Del.quantity cm3/ : 91.5...94.5
1000 s: (89.5...96.5)

RACK STOP ADJUSTMENT

Speed rpm : 600

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 8.90

Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100
Rack travel in mm : 13.90...14.90

Remarks:
:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 12,7 p9
 Edition : 06.07.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 648 139
 Injection pump
 Pump designation : PE8A95D410LS2608
 EP type number : 0 410 698 988
 Governor
 Governor design. : RQV450...1150AB1194L
 Governor no. : 0 420 212 171

Customer-spec. information
 Customer : KHD

Engine : F8L413F

1st version kW : 157.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-
 4- 3

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 10.30...10.40

Del.quantity cm3/ : 9.3...9.5

100 s: (9.1...9.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 450.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 400
 travel mm : 0.30...0.60

2nd speed rpm : 750
 travel mm : 3.50...3.80

3rd speed rpm : 1050
 travel mm : 6.70...6.90

4th speed rpm : 1200
 travel mm : 8.90...9.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 93.5...95.5

1000 : (91.5...97.5)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 60...68

Testing:

1st rack travel in: 7.30
Speed rpm : 1170...1180
2nd rack travel in: 4.00
Speed rpm : 1190...1220
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 6...14
Speed rpm : 450
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

Speed rpm : 510...670

TORQUE CONTROL

Dimension a mm : 1.00
Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 9.30...9.40
2nd speed rpm : 500
Rack travel in m: 10.30...10.40
3rd speed rpm : 995
Rack travel in m: 10.00...10.20
4th speed rpm : 1080
Rack travel in m: 9.50...9.70

START CUT-OUT

Speed 1/min : 370 (390)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 7.30
Speed rpm : 1170...1180

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 116.5...126.5
1000 s: (113.5...129.5)

Remarks:

:

APPLICATION

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 6,2 i 1
Edition : 29.05.90
Replaces : 18.12.87
Test oil : ISO-4113

Combination no. : 0 400 676 141

Injection pump
Pump designation : PE6A90D320RS2547
EP type number : 0 410 696 180
Governor
Governor design. : RSV250...1200A5B779R
Governor no. : 0 420 233 121

Customer-spec. information
Customer : DAF

Engine : DT615

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30
: (2.15...2.35)
Rack travel in mm : 7.50...10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
& maximum rack tra: 21.00
Difference ° CS : 2.50...3.50

BASIC SETTING

1st speed rpm : 1000
Rack travel in mm : 10.80...10.90
Del.quantity cm3/ : 7.1...7.2
100 s: (6.9...7.4)
Spread cm3 : 0.3
100 s: (0.4)

2nd speed rpm : 250.0
Rack travel in mm : 5.9...6.1
Del.quantity cm3/ : 0.9...1.3
100 s: (0.7...1.5)
Spread cm3 : 0.2
100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3
Speed rpm : 800
Rack travel in mm : 0.30...1.00

Governor spring pre-tension
Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1000
Aneroid pressure h: 700
Del.quantity : 71.0...72.0
1000 : (69.0...74.0)
Spread cm3 : 3.00
1000 : (4.50)

RATED SPEED

1st version
Control Lever
position degrees: 97...105

Testing:

1st rack travel in: 9.80
Speed rpm : 1240...1250
2nd rack travel in: 4.00
Speed rpm : 1275...1305
3rd rack travel in: 4.00
Speed rpm : 1285...1315
4th rack travel in: 1450
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 63...71
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 5.5

Testing:

Speed rpm : 100
Speed rpm : 250
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 330...390

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 11.10...11.20
2nd speed rpm : 400
Rack travel in m: 11.30...11.40
3rd speed rpm : 300
Rack travel in m: 11.50...12.00

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 1000
Pressure hPa : 700
Rack travel mm : 10.80...10.90

Measurement

Speed 1/min : 1000

1st pressure hPa : -
Rack travel in m: 9.80...10.00
2nd pressure hPa : 250
Rack travel in m: 10.60...10.70
3rd pressure hPa : 210
Rack travel in m: 10.10...10.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 600
Del.quantity cm3/ : 52.0...53.0
1000 s: (50.0...55.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.80
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 140.0...150.0
1000 s: (137.0...153.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.90...6.10
Del.quantity cm3/ : 9.0...13.0
1000 s: (7.0...15.0)
Spread cm3 : 2.50
1000 s: (4.50)

Remarks:

Cold-start testing of RSV governor
according to VDT-I-420/114.

APPLICATION

Special-purpose vehicle

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 8,3 n 5
 Edition : 21.05.90
 Replaces : 27.6.88
 Test oil : ISO-4113

Combination no. : 0 400 676 175

Injection pump
 Pump designation : PE6A95D410RS2575
 EP type number : 0 410 696 984
 Governor
 Governor design. : RSV250...1200A5C2198
 -1L
 Governor no. : 0 420 232 442

Customer-spec. information
 Customer : DAF

Engine : DH 825

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
 : (1.95...2.15)
 Rack travel in mm : 7.50...10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.40...10.50

Del.quantity cm3/ : 7.3...7.4

100 s: (7.1...7.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0
 Rack travel in mm : 6.1...6.3
 Del.quantity cm3/ : 0.7...1.1
 100 s: (0.4...1.3)
 Spread cm3 : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1200
 Del.quantity : 73.5...74.5
 1000 : (71.5...76.5)
 Spread cm3 : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 109...117

Testing:

1st rack travel in: 9.40
Speed rpm : 1240...1250
2nd rack travel in: 4.00
Speed rpm : 1300...1330
3rd rack travel in: 4.00
Speed rpm : 1340...1370
4th rack travel in: 1505
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 74...82
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 5.7
Speed rpm : 250
Rack travel in mm : 6.10...6.30
Rack travel in mm : 2.00
Speed rpm : 655...715

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1200
Rack travel in m: 10.40...10.50
2nd speed rpm : 500
Rack travel in m: 11.20...11.30
3rd speed rpm : 800
Rack travel in m: 11.10...11.20
4th speed rpm : 940
Rack travel in m: 10.70...11.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800
Del.quantity cm³/ : 74.5...77.5
1000 s: (72.0...80.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 125.0...140.0
1000 s: (122.0...143.0)
Rack travel in mm : 19.50...21.00

Remarks:

:

Cold-start testing of RSV governor

according to VDT-I-420/114.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 8,3 n 7
 Edition : 21.05.90
 Replaces : 30.9.88
 Test oil : ISO-4113
 Combination no. : 0 400 676 178
 Injection pump
 Pump designation : PE6A95D410RS2575
 EP type number : 0 410 696 984
 Governor
 Governor design. : RSV250...750A7C22D1L
 Governor no. : 0 420 232 444

Customer-spec. information
 Customer : DAF

Engine : DHTD 825

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175
 Test Lines : 1 680 750 015
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 2.00...2.10
 : (1.95...2.15)
 Rack travel in mm : 7.50...10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 13.20...13.30
 Del.quantity cm³/ : 11.0...11.1
 100 s: (10.8...11.3)
 Spread cm³ : 0.3
 100 s: (0.6)
 2nd speed rpm : 250.0
 Rack travel in mm : 6.0...6.2
 Del.quantity cm³/ : 0.7...1.3
 100 s: (0.5...1.4)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Del.quantity : 110.5...111.5
 1000 : (108.5...113.5)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 90...98

Testing:
 1st rack travel in: 12.20
 Speed rpm : 750...755
 2nd rack travel in: 4.00
 Speed rpm : 780...795

4th rack travel in: 950
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 66...74

Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 6.1

Testing:

Speed rpm : 100

Minimum rack trave: 19.50

Speed rpm : 250

Rack travel in mm : 6.00...6.20

Rack travel in mm : 2.00

Speed rpm : 255...315

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

STARTING FUEL DELIVERY

Speed rpm : 100

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 250

Rack travel in mm : 6.00...6.20

Del.quantity cm3/ : 7.0...13.0

1000 s: (5.5...14.5)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

:

APPLICATION

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 6,2 n 3
 Edition : 29.05.90
 Replaces : 9.3.87
 Test oil : ISO-4113
 Combination no. : 0 400 676 179
 Injection pump
 Pump designation : PE6A90D32ORS2577
 EP type number : 0 410 696 181
 Governor
 Governor design. : RSV250...750A7C2202R
 Governor no. : 0 420 233 202

Customer-spec. information
 Customer : DAF

Engine : DT 615

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30
 : (2.15...2.35)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
 & maximum rack tra: 21.00
 Difference ° CS : 2.50...3.50

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.00...11.10

Del.quantity cm3/ : 7.4...7.5

100 s: (7.2...7.7)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 250.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.8...1.4

100 s: (0.6...1.6)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 74.5...75.5

1000 : (72.5...77.5)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 90...98

Testing:

1st rack travel in: 10.00

Speed rpm : 750...755
2nd rack travel in: 4.00
Speed rpm : 780...795
4th rack travel in: 950
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 67...75
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 6.0

Testing:

Speed rpm : 100
Minimum rack trave: 19.50
Speed rpm : 250
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 280...340

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

STARTING FUEL DELIVERY

Speed rpm : 100
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.90...6.10
Del.quantity cm3/ : 8.0...14.0
1000 s: (6.0...16.0)
Spread cm3 : 2.50
1000 s: (4.50)

Remarks:

:

APPLICATION

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 6,2 m 3
 Edition : 29.05.90
 Replaces : 9.3.87
 Test oil : ISO-4113
 Combination no. : 0 400 676 181
 Injection pump
 Pump designation : PE6A85D320RS2546
 EP type number : 0 410 686 943
 Governor
 Governor design. : RSV250...750A7C2202R
 Governor no. : 0 420 233 202

Customer-spec. information
 Customer : DAF

Engine : DF615

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175
 Test lines : 1 680 750 015
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 2.15...2.25
 : (2.10...2.30)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
 & maximum rack tra: 21.00
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 12.10...12.20
 Del.quantity cm3/ : 6.6...6.7
 100 s: (6.4...6.9)
 Spread cm3 : 0.3
 100 s: (0.5)
 2nd speed rpm : 250.0
 Rack travel in mm : 8.4...8.6
 Del.quantity cm3/ : 0.9...1.5
 100 s: (0.7...1.7)
 Spread cm3 : 0.2
 100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 3.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Del.quantity : 66.5...67.5
 1000 : (64.5...69.5)
 Spread cm3 : 3.00
 1000 : (5.00)

RATED SPEED

1st version
 Control lever
 position degrees: 90...98

Testing:
 1st rack travel in: 11.10

Speed rpm : 750...755
2nd rack travel in: 4.00
Speed rpm : 780...795
4th rack travel in: 950
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 73...82

Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 8.5

Speed rpm : 250

Rack travel in mm : 8.40...8.60

Rack travel in mm : 2.00

Speed rpm : 295...355

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

STARTING FUEL DELIVERY

Speed rpm : 100

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 250

Rack travel in mm : 8.40...8.60

Del.quantity cm3/ : 9.0...15.0

1000 s: (7.0...17.0)

Spread cm3 : 2.50

1000 s: (4.50)

Remarks:

:

APPLICATION

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 8,3 i 6
 Edition : 29.05.90
 Replaces : 9.3.87
 Test oil : ISO-4113

Combination no. : 0 400 676 182

Injection pump
 Pump designation : PE6A90D410RS2524
 EP type number : 0 410 696 179
 Governor
 Governor design. : RSV250...750A7C2201L
 Governor no. : 0 420 232 444

Customer-spec. information
 Customer : DAF

Engine : DH 825

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.30...2.40
 : (2.25...2.45)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
 & maximum rack tra: 21.00
 Difference ° CS : 4.50...5.50

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 9.70...9.80

Del.quantity cm3/ : 8.3...8.4

100 s: (8.1...8.6)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 250.0

Rack travel in mm : 6.3...6.5

Del.quantity cm3/ : 1.9...2.5

100 s: (1.7...2.7)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 83.0...84.0

1000 : (81.0...86.0)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 90...98

Testing:

1st rack travel in: 8.70

Speed rpm : 750...755
2nd rack travel in: 4.00
Speed rpm : 780...795
4th rack travel in: 950
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 74...82
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 6.4
Speed rpm : 250
Rack travel in mm : 6.30...6.50
Rack travel in mm : 2.00
Speed rpm : 295...355

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

STARTING FUEL DELIVERY

Speed rpm : 100
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 6.30...6.50
Del.quantity cm3/ : 19.0...25.0
1000 s: (17.0...27.0)
Spread cm3 : 2.50
1000 s: (4.50)

Remarks:

:

APPLICATION

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 b10
 Edition : 08.06.90
 Replaces : 1.2.90
 Test oil : ISO-4113
 Combination no. : 0 400 836 043
 Injection pump
 Pump designation : PES6A100D320/3RS2691
 -2
 EP type number : 9 410 230 028
 Governor
 Governor design. : RQV350...1200AB1245R
 Governor no. : 0 420 213 118

Customer-spec. information
 Customer : C.D.C

Engine : 6CT830

1st version kW : 157.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 017

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 11.3...11.5

100 s: (11.1...11.7)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 4.7...4.9
 Del.quantity cm3/ : 1.6...2.0
 100 s: (1.3...2.2)
 Spread cm3 : 0.6
 100 s: (0.8)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
 travel mm : 0.00...0.20
 2nd speed rpm : 350
 travel mm : 1.00...1.50
 3rd speed rpm : 450
 travel mm : 1.90...2.40
 4th speed rpm : 1200
 travel mm : 6.90...6.90
 5th speed rpm : 1350
 travel mm : 8.15...8.65

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1200
 Del.quantity : 113.0...115.0
 1000 : (111.0...117.0)
 Spread cm3 : 4.00
 1000 : (6.50)

RATED SPEED

1st version
Control lever
position degrees: 42...50

Testing:
1st rack travel in: 9.80
Speed rpm : 1240...1250
2nd rack travel in: 4.00
Speed rpm : 1315...1345
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 8...16
Speed rpm : 350
Rack travel in mm : 4.70...4.90

START CUT-OUT

Speed 1/min : 290 (300)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.80
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 150.0...170.0
1000 s: (145.0...175.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 4.70...4.90
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 6.00
1000 s: (8.00)

Remarks:
: C.D.C. # 3917098

Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

Adjust stop lever to 0.5...1.0 mm
before stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 8,0 o 1
 Edition : 06.07.90
 Replaces : 10.85
 Test oil : ISO-4113
 Combination no. : 0 400 845 082
 Injection pump
 Pump designation : PES5A95D410RS2680
 EP type number : 0 410 895 972
 Governor
 Governor design. : RQV300...1150AB1217L
 Governor no. : 0 420 212 186

Customer-spec. information
 Customer : KHD

Engine : F5L413FFRW

1st version kW : 85.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness : 6.00X2.00X600
 x Length mm

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60
 : (1.45...1.65)
 Rack travel in mm : 9.00...12.00

G02

Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 8.30...8.40

Del.quantity cm3/ : 7.2...7.4

100 s: (7.0...7.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.30...1.50

2nd speed rpm : 500

travel mm : 3.40...3.60

3rd speed rpm : 800

travel mm : 5.20...5.60

4th speed rpm : 1150

travel mm : 7.80...8.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1200

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 72.0...74.0

1000 : (70.0...76.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 116...124

Testing:
1st rack travel in: 7.30
Speed rpm : 1190...1200
2nd rack travel in: 4.00
Speed rpm : 1230...1260
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 65...73

Testing:
Speed rpm : 100
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION
Speed rpm : 320...415

TORQUE CONTROL
Dimension a mm : 1.40
Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 8.30...8.40
2nd speed rpm : 500
Rack travel in m: 9.70...9.80
3rd speed rpm : 840
Rack travel in m: 9.30...9.50
4th speed rpm : 1010
Rack travel in m: 8.60...8.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 700
Del.quantity cm³/ : 80.5...83.5
1000 s: (78.0...86.0)
Speed rpm : 100
Del.quantity cm³/ : 65.0...70.0
1000 s: (62.5...72.5)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 7.30
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 120.0...130.0
1000 s: (117.0...133.0)
Rack travel in mm : 14.30...14.70

Remarks:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

2. Set fuel delivery in fuel-delivery
characteristics with stop above the
governor housing.

When accelerating from engine speed
"0", no voltage in starting solenoid.

APPLICATION

Below-ground operation

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 a
 Edition : 06.07.90
 Replaces : 11.7.88
 Test oil : ISO-4113

Combination no. : 0 400 846 522

Injection pump
 Pump designation : PES6A90D410RS2667
 EP type number : 0 410 896 080
 Governor
 Governor design. : RQV300...1400AB1065-4L
 Governor no. : 0 420 212 168

Customer-spec. information
 Customer : DAIMLER-BENZ

Engine : OM 366

1st version kW : 100.0
 Rated speed : 2800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35
 : (2.20...2.40)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 6.3...6.4

100 s: (6.1...6.6)

Spread cm3 : 0.3

100 s: (0.4)

2nd speed rpm : 300.0

Rack travel in mm : 8.9...9.1

Del.quantity cm3/ : 0.9...1.3

100 s: (0.7...1.5)

Spread cm3 : 0.2

100 s: (0.4)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.80...1.30

2nd speed rpm : 500

travel mm : 2.30...2.80

3rd speed rpm : 750

travel mm : 4.10...4.30

4th speed rpm : 1500

travel mm : 8.50...8.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Del.quantity : 63.5...64.5

1000 : (61.5...66.5)

Spread cm3 : 3.00

1000 : (4.50)

RATED SPEED

1st version

Control lever

position degrees: 108...116

Testing:

1st rack travel in: 10.10

Speed rpm : 1440...1450
2nd rack travel in: 4.00
Speed rpm : 1540...1570
4th rack travel in: 1650
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 74...82

Testing:
Speed rpm : 100
Minimum rack travel: 10.30
Speed rpm : 300
Rack travel in mm : 8.90...9.10

CONSTANT REGULATION
Speed rpm : 540...680

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1400
Rack travel in m: 11.10...11.20
2nd speed rpm : 500
Rack travel in m: 12.20...12.40
3rd speed rpm : 900
Rack travel in m: 11.80...12.10
4th speed rpm : 1100
Rack travel in m: 11.40...11.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 500
Del.quantity cm³/ : 52.0...54.0
1000 s: (49.5...56.5)
Speed rpm : 900
Del.quantity cm³/ : 55.0...58.0
1000 s: (52.5...60.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.10
Speed rpm : 1440...1450

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 78.0...88.0
1000 s: (75.0...91.0)

Rack travel in mm : 17.00...17.40

Remarks:

:

Set shutoff stop to contact at
3.0...3.5 mm control-rod travel.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 6,2 o 2
Edition : 19.03.90
Replaces : 12.1.90
Test oil : ISO-4113

Combination no. : 0 400 846 538

Injection pump
Pump designation : PES6A95D32ORS2693
EP type number : 0 410 896 914
Governor
Governor design. : RQ300/1300AB1204R
Governor no. : 0 420 201 640

Customer-spec. information
Customer : DAF

Engine : DNT 620

1st version kW : 130.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness : 6.00X1.50X600
x Length mm

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
: (1.95...2.15)
Rack travel in mm : 7.50...10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
& maximum rack tra: 21.00
Difference ° CS : 2.50...3.50

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 11.50...11.60

Del.quantity cm3/ : 7.6...7.8

100 s: (7.4...8.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0
Rack travel in mm : 6.5...6.7
Del.quantity cm3/ : 0.7...1.1
100 s: (0.4...1.3)
Spread cm3 : 0.3
100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -2
Speed rpm : 800
Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 850
Aneroid pressure h: 700
Del.quantity : 76.0...78.0
1000 : (74.0...80.0)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version
Setting point:
Speed rpm : 800
Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.70
Speed rpm : 1350...1365
2nd rack travel in: 4.00
Speed rpm : 1420...1450
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.6

Testing:

Speed rpm : 100
Minimum rack travel: 7.30
Speed rpm : 300
Rack travel in mm : 6.50...6.70

TORQUE CONTROL

Dimension a mm : 0.55
Torque control curve - 1st version
1st speed rpm : 1290
Rack travel in m: 10.70...10.80
2nd speed rpm : 850
Rack travel in m: 12.00...12.40
3rd speed rpm : 935
Rack travel in m: 11.50...11.90
4th speed rpm : 1080
Rack travel in m: 10.80...11.10

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 700
Rack travel mm : 11.50...11.60

Measurement

Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 11.10...11.30
2nd pressure hPa : 250
Rack travel in m: 11.40...11.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 1290

Del.quantity cm3/ : 74.0...76.0
1000 s: (71.5...78.5)
Aneroid pressure h: -
Speed rpm : 600
Del.quantity cm3/ : 65.0...67.0
1000 s: (63.0...69.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.70
Speed rpm : 1350...1365

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...145.0
1000 s: (127.0...148.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.50...6.70
Del.quantity cm3/ : 7.0...11.0
1000 s: (4.5...13.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 6,2 p
Edition : 29.05.90
Replaces : 14.7.89
Test oil : ISO-4113

Combination no. : 0 400 846 539

Injection pump
Pump designation : PES6A95D32ORS2693
EP type number : 0 410 896 914
Governor
Governor design. : RQ300/1300AB1205R
Governor no. : 0 420 201 642

Customer-spec. information
Customer : DAF

Engine : DNTD 620

1st version kw : 110.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
: (1.95...2.15)
Rack travel in mm : 7.50...10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
& maximum rack tra: 21.00
Difference ° CS : 2.50...3.50

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 6.4...6.5

100 s: (6.2...6.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.7...6.9

Del.quantity cm3/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 800

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Del.quantity : 64.5...65.5

1000 : (62.5...67.5)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 800

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.30
Speed rpm : 1335...1350
2nd rack travel in: 4.00
Speed rpm : 1400...1430
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.8

Testing:

Speed rpm : 100
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 6.70...6.90
Rack travel in mm : 2.00
Speed rpm : 550...590

TORQUE CONTROL

Dimension a mm : 0.35
Torque control curve - 1st version
1st speed rpm : 1290
Rack travel in m: 10.30...10.40
2nd speed rpm : 850
Rack travel in m: 11.10...11.50
3rd speed rpm : 970
Rack travel in m: 10.80...11.20
4th speed rpm : 1050
Rack travel in m: 10.50...10.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1290
Del.quantity cm³/ : 69.0...71.0
1000 s: (66.5...73.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.30
Speed rpm : 1335...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 130.0...145.0
1000 s: (127.0...148.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.70...6.90
Del.quantity cm³/ : 7.0...11.0
1000 s: (4.5...13.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 9,6 s
 Edition : 17.05.90
 Replaces : 12.9.86
 Test oil : ISO-4113

Combination no. : 0 400 846 544

Injection pump
 Pump designation : PES6A95D410RS2416
 EP type number : 0 410 896 961
 Governor
 Governor design. : RQV300...1250AB1211L
 Governor no. : 0 420 212 184

Customer spec. information
 Customer : KHD

Engine : F6L413FR

1st version kW : 123.0
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00
 : (1.85...2.05)
 Rack travel in mm : 9.00...12.00

G10

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.00...10.10

Del.quantity cm3/ : 9.9...10.1

100 s: (9.7...10.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.9...2.5

100 s: (1.6...2.7)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.00...1.20

2nd speed rpm : 500

travel mm : 3.20...3.50

3rd speed rpm : 1000

travel mm : 6.20...6.40

4th speed rpm : 1250

travel mm : 8.20...8.30

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1280

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 99.0...101.0

1000 : (97.0...103.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 118...126

Testing:
1st rack travel in: 9.00
Speed rpm : 1290...1300
2nd rack travel in: 4.50
Speed rpm : 1350...1380
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 84...92

Testing:
Speed rpm : 100
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION
Speed rpm : 370...485

TORQUE CONTROL
Dimension a mm : 0.30
Torque control curve - 1st version
1st speed rpm : 1250
Rack travel in m: 10.00...10.10
2nd speed rpm : 600
Rack travel in m: 10.20...10.30
3rd speed rpm : 715
Rack travel in m: 10.10...10.30
4th speed rpm : 765
Rack travel in m: 10.00...10.30

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 600
Del.quantity cm³/ : 91.5...94.5
1000 s: (89.0...97.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.00
Speed rpm : 1290...1300

INTERMEDIATE RATED SPEED
Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 120.0...130.0
1000 s: (117.0...133.0)
Rack travel in mm : 14.20...14.60

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.40...6.60
Del.quantity cm³/ : 19.0...25.0
1000 s: (16.5...27.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

APPLICATION

Special-purpose vehicle

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 9,6 m 1
 Edition : 06.07.90
 Replaces : 8.9.89
 Test oil : ISO-4113
 Combination no. : 0 400 846 545
 Injection pump
 Pump designation : PES6A95D410RS2681
 EP type number : 0 410 896 918
 Governor
 Governor design. : RQV300...1150AB1217L
 Governor no. : 0 420 212 186

Customer-spec. information
 Customer : KHD

Engine : F6L413FRW

1st version kW : 102.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60
 : (1.45...1.65)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 8.30...8.40

Del.quantity cm3/ : 7.2...7.4

100 s: (7.0...7.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.30...1.50

2nd speed rpm : 500

travel mm : 3.40...3.60

3rd speed rpm : 800

travel mm : 5.20...5.60

4th speed rpm : 1150

travel mm : 7.80...8.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1200

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 72.0...74.0

1000 : (70.0...76.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 116...124

Testing:
1st rack travel in: 7.30
Speed rpm : 1190...1200
2nd rack travel in: 4.00
Speed rpm : 1230...1260
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 65...73

Testing:
Speed rpm : 100
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION
Speed rpm : 320...415

TORQUE CONTROL
Dimension a mm : 1.40
Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 8.30...8.40
2nd speed rpm : 500
Rack travel in m: 9.70...9.80
3rd speed rpm : 840
Rack travel in m: 9.30...9.50
4th speed rpm : 1010
Rack travel in m: 8.60...8.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 700
Del.quantity cm³/ : 80.5...83.5
1000 s: (78.0...86.0)
Speed rpm : 100
Del.quantity cm³/ : 65.0...70.0
1000 s: (62.5...72.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 7.30
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 120.0...130.0
Rack travel in mm : 14.40...14.80

Remarks:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

2. Set fuel delivery in fuel-delivery
characteristics with stop above the
governor housing.

When accelerating from engine speed
"0", no voltage in starting solenoid.

APPLICATION

Below-ground operation

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE 8,4 b 1
 Edition : 10.08.90
 Replaces : 25.8.89
 Test oil : ISO-4113
 Combination no. : 0 400 846 562
 Injection pump
 Pump designation : PES6A100D410RS2687
 EP type number : 0 410 806 001
 Governor
 Governor design. : RQV400...1000AB1231L
 Governor no. : 0 420 212 206

Customer-spec. information
 Customer : LIEBHERR

Engine : D906TI

1st version kW : 169.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test Lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80
 : (2.65...2.85)
 Rack travel in mm : 9.00...12.00

G14

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00
 & maximum rack tra: 21.00
 Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.70...13.80

Del.quantity cm3/ : 13.9...14.1

100 s: (13.7...14.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0
 Rack travel in mm : 6.8...7.0
 Del.quantity cm3/ : 1.0...1.6
 100 s: (0.7...1.8)
 Spread cm3 : 0.3
 100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 440
 travel mm : 2.10...2.30
 2nd speed rpm : 500
 travel mm : 3.00...3.50
 3rd speed rpm : 585
 travel mm : 3.50...4.00
 4th speed rpm : 1045
 travel mm : 8.10...8.20
 5th speed rpm : 1135
 travel mm : 9.40...9.70

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1065
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1000

Aneroid pressure h: 700
Del.quantity : 139.0...141.0
1000 : (137.0...143.0)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 116...124

Testing:
1st rack travel in: 12.70
Speed rpm : 1040...1050
2nd rack travel in: 4.00
Speed rpm : 1130...1160
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 66...74

Testing:
Speed rpm : 100
Minimum rack trave: 8.30
Speed rpm : 400
Rack travel in mm : 6.80...7.00

CONSTANT REGULATION
Speed rpm : 425...500

TORQUE CONTROL
Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 13.70...13.80
2nd speed rpm : 500
Rack travel in m: 13.70...13.90

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 13.70...13.80

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 12.60...12.80
2nd pressure hPa : 435
Rack travel in m: 13.30...13.40
3rd pressure hPa : 410
Rack travel in m: 12.80...13.00

START CUT-OUT

Speed 1/min : 320 (340)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 700
Del.quantity cm3/ : 134.0...136.0
1000 s: (131.5...138.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 104.5...106.5
1000 s: (102.5...108.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.70
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 105.0...115.0
1000 s: (102.0...118.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 6.80...7.00
Del.quantity cm3/ : 10.0...16.0
1000 s: (7.5...18.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RAB 9,7 b 2
Edition : 31.07.90
Replaces : 9.11.89
Test oil : ISO-4113

Combination no. : 0 400 846 576

Injection pump
Pump designation : PES6A95D420LS2595
EP type number : 0 410 896 930
Governor
Governor design. : RQ200/1050AB1246R
Governor no. : 0 420 201 647

Customer-spec. information
Customer : RABA

Engine : D2156 MT6U

1st version kW : 154.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
: (1.95...2.05)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 12.4...12.6

100 s: (12.2...12.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 200.0
Rack travel in mm : 7.2...7.4
Del.quantity cm3/ : 1.1...1.5
100 s: (0.8...1.7)
Spread cm3 : 0.3
100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 500

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1050
Aneroid pressure h: 700
Del.quantity : 124.5...126.5
1000 : (122.5...128.5)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version

Setting point:
Speed rpm : 500
Rack travel in mm : 20.0

Testing:
1st rack travel in: 11.40
Speed rpm : 1095...1110
2nd rack travel in: 4.00
Speed rpm : 1130...1160

4th rack travel in: 1225
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 200
Rack travel in mm : 6.5

Testing:

Speed rpm : 100
Minimum rack travel: 8.00
Speed rpm : 200
Rack travel in mm : 6.40...6.60
Rack travel in mm : 2.00
Speed rpm : 290...330

TORQUE CONTROL

Dimension a mm : 0.40
Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 12.40...12.50
2nd speed rpm : 450
Rack travel in m: 13.40...13.80
3rd speed rpm : 680
Rack travel in m: 12.90...13.30
4th speed rpm : 830
Rack travel in m: 12.60...12.90

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 13.20...13.30

Measurement

Speed 1/min : 500
Rack travel in m: 10.80...11.00
2nd pressure hPa : 220
Rack travel in m: 12.40...12.50
3rd pressure hPa : 150
Rack travel in m: 11.10...11.30

START CUT-OUT

Speed 1/min : 140 (160)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 600
Del.quantity cm³/ : 120.5...123.5
1000 s: (118.0...126.0)
Speed rpm : 500

Del.quantity cm³/ : 79.0...81.0
1000 s: (77.0...83.0)

RACK STOP ADJUSTMENT

Speed rpm : 500

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.40
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 153.0...163.0
1000 s: (150.0...166.0)
Rack travel in mm : 17.50...17.70

Remarks:

Set idle stop at 200 min -1 to a
control-rod travel of 6.4 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 y
 Edition : 08.06.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 846 579
 Injection pump
 Pump designation : PES6A95D320RS2779
 EP type number : 0 410 896 903
 Governor
 Governor design. : RQV350...1350AB1248-
 R
 Governor no. : 0 420 213 120

Customer-spec. information
 Customer : NAVISTAR

Engine : DT 360

1st version kW : 126.0
 Rated speed : 2700

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
 assembly : 1 688 901 110

Opening
 pressure, bar : 250...253

Orifice plate
 diameter mm : 0,5

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.65...2.75
 : (2.60...2.80)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1350

Rack travel in mm : 12.30...12.40

Del.quantity cm3/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 1.7...2.1

100 s: (1.5...2.3)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 7.30...7.50

2nd speed rpm : 1460

travel mm : 8.10...8.50

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1350

Aneroid pressure h: 900

Del.quantity : 84.0...86.0

1000 : (82.0...88.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 44...52

Testing:
1st rack travel in: 11.30
Speed rpm : 1390...1420
2nd rack travel in: 4.00
Speed rpm : 1525...1535
4th rack travel in: 1625
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 11...19

Testing:
Speed rpm : 100
Minimum rack travel: 9.00
Speed rpm : 350
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION
Speed rpm : 350...500

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 12.30...12.40

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.10...9.30
2nd pressure hPa : 240
Rack travel in m: 10.00...10.10
3rd pressure hPa : 445
Rack travel in m: 11.20...11.60

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 61.5...65.5
1000 s: (59.5...67.5)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.30
Speed rpm : 1390...1420

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 135.0...155.0
1000 s: (130.0...160.0)
Rack travel in mm : 16.20...17.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.90...6.10
Del.quantity cm3/ : 17.0...21.0
1000 s: (15.0...23.0)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:
: NAVISTAR #1816726C91

Adjust stop lever to 0.5...1.0 mm
before stop.

Start-of-delivery mark is at start of
delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 y 1
 Edition : 08.06.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 846 580
 Injection pump
 Pump designation : PES6A95D320RS2779
 EP type number : 0 410 896 903
 Governor
 Governor design. : RQV350...1350AB1248-1R
 Governor no. : 0 420 213 121

Customer-spec. information
 Customer : NAVISTAR

Engine : DTA 360

1st version kW : 138.0
 Rated speed : 2700

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder
 assembly : 1 688 901 110

Opening
 pressure, bar : 250...253

Orifice plate
 diameter mm : 0,5

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.65...2.75
 : (2.60...2.80)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1350

Rack travel in mm : 12.30...12.40

Del.quantity cm³/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm³/ : 1.7...2.1

100 s: (1.5...2.3)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 7.30...7.50

2nd speed rpm : 1460

travel mm : 8.10...8.50

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1350

Aneroid pressure h: 900

Del.quantity : 84.0...86.0

1000 : (82.0...88.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 44...52

Testing:
1st rack travel in: 11.30
Speed rpm : 1390...1420
2nd rack travel in: 4.00
Speed rpm : 1525...1535
4th rack travel in: 1625
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 11...19
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.0

Testing:
Speed rpm : 100
Minimum rack travel: 9.00
Speed rpm : 350
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION
Speed rpm : 350...500

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 12.30...12.40

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.20...9.40
2nd pressure hPa : 215
Rack travel in m: 10.00...10.10
3rd pressure hPa : 430
Rack travel in m: 11.30...11.70

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 63.5...67.5
1000 s: (62.5...69.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.30
Speed rpm : 1390...1420

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 145.0...165.0
1000 s: (140.0...170.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.90...6.10
Del.quantity cm3/ : 17.0...21.0
1000 s: (15.0...23.0)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:
: NAVISTAR #1816728C91

Adjust stop lever to 0.5...1.0 mm
before stop.

Start-of-delivery mark is at start of
delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 j
 Edition : 31.07.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 846 584
 Injection pump
 Pump designation : PES6A95D410RS2797
 EP type number : 0 410 896 900
 Governor
 Governor design. : RQV300...1400AB1065-20L
 Governor no. : 0 420 212 225

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM 366

1st version kW : 97.0
 Rated speed : 2800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 9.30...9.40

Del.quantity cm3/ : 6.6...6.8

100 s: (6.4...7.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 8.0...8.2

Del.quantity cm3/ : 0.8...1.2

100 s: (0.5...1.4)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.80...1.30

2nd speed rpm : 500

travel mm : 2.30...2.80

3rd speed rpm : 750

travel mm : 4.10...4.30

4th speed rpm : 1500

travel mm : 8.50...8.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1450

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Del.quantity : 66.0...68.0

1000 : (64.0...70.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control Lever
position degrees: 109...117

Testing:
1st rack travel in: 8.30
Speed rpm : 1450...1460
2nd rack travel in: 4.00
Speed rpm : 1520...1550
4th rack travel in: 1670
Speed rpm : 0.00...1.00

LOW IDLE 1
Control Lever
position degrees: 70...78

Testing:
Speed rpm : 100
Minimum rack travel: 9.50
Speed rpm : 300
Rack travel in mm : 8.00...8.20

CONSTANT REGULATION
Speed rpm : 450...580

TORQUE CONTROL
Dimension a mm : 0.90
Torque control curve - 1st version
1st speed rpm : 1400
Rack travel in m: 9.30...9.40
2nd speed rpm : 600
Rack travel in m: 10.20...10.40
3rd speed rpm : 900
Rack travel in m: 9.50...9.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 500
Del.quantity cm³/ : 53.0...56.0
1000 s: (50.5...58.5)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 8.30
Speed rpm : 1450...1460

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm³/ : 78.0...88.0
1000 s: (75.0...91.0)
Rack travel in mm : 13.70...14.10

Remarks:

Set shutoff stop to contact at
3.0...3.5 mm control-rod travel.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MMM 3,1 b 2
 Edition : 31.08.90
 Replaces : 30.3.90
 Test oil : ISO-4113

Combination no. : 0 400 863 008

Injection pump
 Pump designation : PES3A90D320/3RS2658
 EP type number : 0 410 893 004
 Governor
 Governor design. : RSV325...1500A2C505-3R
 Governor no. : 0 420 233 229

Customer-spec. information
 Customer : MMM

Engine : D226B-3

1st version kW : 49.5
 Rated speed : 3000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05
 : (2.90...3.10)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 2- 3

Phasing : 0-120-240

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...0.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.20...11.30

Del.quantity cm3/ : 8.9...9.0

100 s: (8.7...9.2)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 9.7...9.9

Del.quantity cm3/ : 4.6...5.2

100 s: (4.4...5.4)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 89.5...90.5

1000 : (87.5...92.5)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 89...97

Testing:

1st rack travel in: 10.20
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1180...1210
3rd rack travel in: 4.00
Speed rpm : 1210...1240
4th rack travel in: 1375
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever
position degrees: 63...71
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 9.3
Speed rpm : 325
Rack travel in mm : 9.70...9.90
Rack travel in mm : 2.00
Speed rpm : 480...540

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 11.20...11.30
2nd speed rpm : 500
Rack travel in m: 11.20...11.40

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.20
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 115.0
1000 s: (112.0)
Rack travel in mm : 16.80...21.00

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 3.0 f
 Edition : 21.05.90
 Replaces : 6.4.90
 Test oil : ISO-4113

Combination no. : 0 400 863 016

Injection pump
 Pump designation : PES3A85D410/3RS2780
 EP type number : 0 410 883 987
 Governor
 Governor design. : RSV325...1250A2C2239
 -1L
 Governor no. : 0 420 232 533

Customer-spec. information
 Customer : KHD

Engine : F3L912 F

1st version kW : 40.0
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05
 : (2.90...3.10)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 3- 2

Phasing : 0-120-240

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1235

Rack travel in mm : 11.40...11.50

Del.quantity cm3/ : 6.4...6.5

100 s: (6.2...6.7)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 8.1...8.3

Del.quantity cm3/ : 1.0...1.6

100 s: (0.8...1.8)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1235

Del.quantity : 64.0...65.0

1000 : (62.0...67.0)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 100...108

Testing:

1st rack travel in: 10.40

Speed rpm : 1275...1285

2nd rack travel in: 4.00

Speed rpm : 1345...1375
3rd rack travel in: 4.00
Speed rpm : 1355...1385
4th rack travel in: 1520
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 71...79
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 5.5

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 325
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 435...495

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1235
Rack travel in m: 11.40...11.50
2nd speed rpm : 500
Rack travel in m: 11.60...11.70
3rd speed rpm : 840
Rack travel in m: 11.50...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm³/ : 55.0...57.0
1000 s: (52.5...59.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.40
Speed rpm : 1275...1285

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 115.0...125.0
1000 s: (112.0...128.0)
Rack travel in mm : 19.50...21.00

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 4,1 b 1
 Edition : 31.08.90
 Replaces : 5.8.88
 Test oil : ISO-4113

Combination no. : 0 400 864 057

Injection pump
 Pump designation : PES4A90D320/3RS2659
 EP type number : 0 410 894 028
 Governor
 Governor design. : RSV325...1500A2C505-
 2R
 Governor no. : 0 420 233 196

Customer-spec. information
 Customer : MWM

Engine : D226B-4

1st version kW : 73.5
 Rated speed : 3000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05
 : (2.90...3.10)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...0.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1500

Rack travel in mm : 11.20...11.30

Del.quantity cm3/ : 9.0...9.1

100 s: (8.8...9.3)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 7.0...7.2

Del.quantity cm3/ : 0.8...1.4

100 s: (0.6...1.6)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1500

Del.quantity : 90.0...91.0

1000 : (88.0...93.0)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version
 Control lever
 position degrees: 109...117

Testing:

1st rack travel in: 9.50
Speed rpm : 1540...1550
2nd rack travel in: 4.00
Speed rpm : 1590...1620
3rd rack travel in: 4.00
Speed rpm : 1615...1645
4th rack travel in: 1780
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 6.6

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 325
Rack travel in mm : 7.00...7.20
Rack travel in mm : 2.00
Speed rpm : 465...525

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1500
Rack travel in m: 11.20...11.30
2nd speed rpm : 500
Rack travel in m: 11.20...11.40

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.50
Speed rpm : 1540...1550

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...140.0
1000 s: (127.0...143.0)
Rack travel in mm : 19.50...21.00

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 4,1 i
 Edition : 21.05.90
 Replaces : 6.4.90
 Test oil : ISO-4113
 Combination no. : 0 400 864 075
 Injection pump
 Pump designation : PES4A85D410/3RS2781
 EP type number : 0 410 884 945
 Governor
 Governor design. : RSV325...1250A2C2239
 -1L
 Governor no. : 0 420 232 533

Customer-spec. information
 Customer : KHD

Engine : F4L912F

1st version kw : 54.0
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness : 6.00X2.00X600
 x Length mm

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05
 : (2.90...3.10)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1235

Rack travel in mm : 11.40...11.50

Del.quantity cm3/ : 6.4...6.5

100 s: (6.2...6.7)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 8.1...8.3

Del.quantity cm3/ : 1.0...1.6

100 s: (0.8...1.8)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1235

Del.quantity : 64.0...65.0

1000 : (62.0...67.0)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 100...108

Testing:

1st rack travel in: 10.40

Speed rpm : 1275...1285

2nd rack travel in: 4.00

Speed rpm : 1345...1375

3rd rack travel in: 4.00

Speed rpm : 1355...1385
4th rack travel in: 1520
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 68...76
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 5.5

Testing:

Speed rpm : 100
Minimum rack trave: 19.50
Speed rpm : 325
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 435...495

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1235
Rack travel in m: 11.40...11.50
2nd speed rpm : 500
Rack travel in m: 11.60...11.70
3rd speed rpm : 840
Rack travel in m: 11.50...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm³/ : 55.0...57.0
1000 s: (52.5...59.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.40
Speed rpm : 1275...1285

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 115.0...125.0
1000 s: (112.0...128.0)
Rack travel in mm : 19.50...21.00

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 4,1 b 3
 Edition : 31.08.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 864 079
 Injection pump
 Pump designation : PES4A90D320/3RS2659
 EP type number : 0 410 894 028
 Governor
 Governor design. : RSV325...1175A0C2247
 -1R
 Governor no. : 0 420 233 271

Customer-spec. information
 Customer : MWM

Engine : TD224/ 4

1st version kW : 72.0
 Rated speed : 2350

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05
 : (2.90...3.10)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...0.00
 & maximum rack tra: 21.00
 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1175

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 8.0...8.1

100 s: (7.8...8.3)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 7.0...7.2

Del.quantity cm3/ : 0.8...1.4

100 s: (0.6...1.6)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1175

Aneroid pressure h: 700

Del.quantity : 80.5...81.5

1000 : (78.5...83.5)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 93...101

Testing:

1st rack travel in: 9.80
Speed rpm : 1215...1225
2nd rack travel in: 4.00
Speed rpm : 1250...1280
3rd rack travel in: 4.00
Speed rpm : 1270...1300
4th rack travel in: 1430
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 64...72
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 5.5

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 325
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 480...540

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1175
Rack travel in m: 10.80...10.90
2nd speed rpm : 500
Rack travel in m: 11.70...11.80
4th speed rpm : 920
Rack travel in m: 11.20...11.40

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 11.50...11.60

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 10.70...10.80
2nd pressure hPa : 310
Rack travel in m: 11.20...11.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 750

Del.quantity cm3/ : 81.0...83.0
1000 s: (78.5...85.5)
Aneroid pressure h: 230
Speed rpm : 600
Del.quantity cm3/ : 72.5...74.5
1000 s: (70.0...77.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 63.0...64.0
1000 s: (61.0...66.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.80
Speed rpm : 1215...1225

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...140.0
1000 s: (127.0...143.0)
Rack travel in mm : 19.50...21.00

Remarks:

: RENAULT

APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 6,1 a11
 Edition : 08.06.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 866 083
 Injection pump
 Pump designation : PES6A85D410/3RS2532
 EP type number : 0 410 886 909
 Governor
 Governor design. : RSV325...1400A8C674-4L
 Governor no. : 0 420 232 544

Customer-spec. information
 Customer : KHD

Engine : BF6L913

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 0 681 343 009
 Opening pressure, bar : 172...175
 Test lines : 1 680 750 014
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 1.90...2.00
 : (1.85...2.05)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1250
 Rack travel in mm : 12.40...12.50
 Del.quantity cm3/ : 8.3...8.4
 100 s: (8.1...8.6)
 Spread cm3 : 0.3
 100 s: (0.4)
 2nd speed rpm : 325.0
 Rack travel in mm : 6.6...6.8
 Del.quantity cm3/ : 0.9...1.5
 100 s: (0.7...1.7)
 Spread cm3 : 0.2
 100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.70...1.00

Governor spring pre-tension
 Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1250
 Aneroid pressure h: 500
 Del.quantity : 83.5...84.5
 1000 : (81.5...86.5)
 Spread cm3 : 3.00
 1000 : (4.50)

RATED SPEED

1st version
 Control lever
 position degrees: 67...75

Testing:

1st rack travel in: 11.40
 Speed rpm : 1440...1450
 2nd rack travel in: 4.00
 Speed rpm : 1485...1515
 4th rack travel in: 1620
 Speed rpm : 0.30...1.70

LOW IDLE 1

Control Lever

position degrees: 17...25
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 6.2

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 325
Rack travel in mm : 6.60...6.80
Rack travel in mm : 2.00
Speed rpm : 585...645
Speed rpm : 700
Maximum rack travel: 1.00

TORQUE CONTROL

2nd speed rpm : 500
Rack travel in m: 13.70...13.80
3rd speed rpm : 1000
Rack travel in m: 13.30...13.50
4th speed rpm : 1400
Rack travel in m: 12.40...12.50

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 13.70...13.80

Measurement

Speed 1/min : 500

1st pressure hPa : 375
Rack travel in m: 13.40...13.50
2nd pressure hPa : 160
Rack travel in m: 12.30...12.60
3rd pressure hPa : -
Rack travel in m: 11.80...11.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm³/ : 60.0...63.0
1000 s: (58.0...65.0)
Spread cm³ : -
1000 s: (5.50)

BREAKAWAY

1st version

H07

1mm rack travel less than

full load rack tr: 11.40
Speed rpm : 1440...1450

STARTING FUEL DELIVERY

Speed rpm : 100
Rack travel in mm : 17.60...18.20

LOW IDLE

Speed rpm : 325
Rack travel in mm : 6.60...6.80
Del.quantity cm³/ : 9.0...15.0
1000 s: (7.0...17.0)
Spread cm³ : 2.00
1000 s: (4.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 1 g 46
 Edition : 17.05.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 866 111
 Injection pump
 Pump designation : PES6A85D410/3RS2611
 EP type number : 0 410 886 902
 Governor
 Governor design. : RSV325...1200AOC2148
 L
 Governor no. : 0 420 232 293

Customer-spec. information
 Customer : KHD

Engine : F6L913

1st version kW : 85.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60
 : (2.45...2.65)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.40...10.50

Del.quantity cm³/ : 6.1...6.2

100 s: (5.9...6.4)

Spread cm³ : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 8.4...8.6

Del.quantity cm³/ : 0.8...1.4

100 s: (0.6...1.6)

Spread cm³ : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 61.5...62.5

1000 : (59.5...64.5)

Spread cm³ : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 101...109

Testing:

1st rack travel in: 9.40

Speed rpm : 1240...1250

2nd rack travel in: 4.00

Speed rpm : 1295...1325

4th rack travel in: 1460

Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 76...84

Setting point w/out bumper spring

Speed rpm : 325

Rack travel in mm : 8.5

Speed rpm : 325

Rack travel in mm : 8.40...8.60

Rack travel in mm : 2.00

Speed rpm : 450...510

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1200

Rack travel in m: 10.40...10.50

2nd speed rpm : 500

Rack travel in m: 11.10...11.30

4th speed rpm : 1000

Rack travel in m: 10.80...12.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800

Del.quantity cm³/ : 54.0...56.0

1000 s: (51.5...58.5)

Speed rpm : 1000

Del.quantity cm³/ : 60.0...62.0

1000 s: (57.5...64.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40

Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm³/ : 100.0...110.0

1000 s: (97.0...113.0)

Rack travel in mm : 16.90...17.30

Remarks:

: DX6.30

APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 6,2 e 4
 Edition : 31.08.90
 Replaces : 21.4.89
 Test oil : ISO-4113

Combination no. : 0 400 866 112

Injection pump
 Pump designation : PES6A90D320/3RS2660
 EP type number : 0 410 896 078
 Governor
 Governor design. : RSV325...1500A2C505-2R
 Governor no. : 0 420 233 196

Customer spec. information
 Customer : MWM

Engine : D226-6

1st version kW : 110.0
 Rated speed : 3000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05
 : (2.90...3.10)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
 & maximum rack tra: 21.00
 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1500

Rack travel in mm : 11.20...11.30

Del. quantity cm3/ : 8.9...9.0

100 s: (8.7...9.2)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0
 Rack travel in mm : 7.0...7.2
 Del. quantity cm3/ : 0.8...1.4
 100 s: (0.6...1.6)
 Spread cm3 : 0.2
 100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1500
 Del. quantity : 89.5...90.5
 1000 : (87.5...92.5)
 Spread cm3 : 3.00
 1000 : (5.00)

RATED SPEED

1st version
 Control lever
 position degrees: 109...117

Testing:

1st rack travel in: 10.20
Speed rpm : 1540...1550
2nd rack travel in: 4.00
Speed rpm : 1590...1620
3rd rack travel in: 4.00
Speed rpm : 1605...1635
4th rack travel in: 1780
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 68...76
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 6.6

Testing:

Speed rpm : 100
Minimum rack trave: 19.50
Speed rpm : 325
Rack travel in mm : 7.00...7.20
Rack travel in mm : 2.00
Speed rpm : 450...510

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1500
Rack travel in m: 11.20...11.30
2nd speed rpm : 500
Rack travel in m: 11.20...11.40

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.20
Speed rpm : 1540...1550

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...140.0
1000 s: (127.0...143.0)
Rack travel in mm : 19.50...21.00

Remarks:

:

APPLICATION

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MM 6,2 e 6
 Edition : 21.05.90
 Replaces : 18.12.87
 Test oil : ISO-4113
 Combination no. : 0 400 866 122
 Injection pump
 Pump designation : PES6A90D320/3RS2660
 EP type number : 0 410 896 078
 Governor
 Governor design. : RSV325...1200ADC2182
 -3R
 Governor no. : 0 420 233 212

Customer-spec. information
 Customer : MM

Engine : TD226B-6

1st version kW : 123.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05
 : (2.90...3.10)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : -1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
 & maximum rack tra: 21.00
 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1180

Rack travel in mm : 11.60...11.70

Del.quantity cm3/ : 8.9...9.0

100 s: (8.7...9.2)

Spread cm3 : 0.3

100 s: (0.4)

2nd speed rpm : 325.0
 Rack travel in mm : 7.1...7.3
 Del.quantity cm3/ : 1.0...1.6
 100 s: (0.8...1.8)
 Spread cm3 : 0.2
 100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1180
 Aneroid pressure h: 700
 Del.quantity : 89.0...90.0
 1000 : (87.0...92.0)
 Spread cm3 : 3.00
 1000 : (4.50)

RATED SPEED

1st version

Control lever
position degrees: 90...98

Testing:

1st rack travel in: 10.60
Speed rpm : 1220...1230
2nd rack travel in: 4.00
Speed rpm : 1240...1270
3rd rack travel in: 4.00
Speed rpm : 1260...1290
4th rack travel in: 1435
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 63...71
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 6.7

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 325
Rack travel in mm : 7.10...7.30
Rack travel in mm : 2.00
Speed rpm : 485...545

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1180
Rack travel in m: 11.60...11.70
2nd speed rpm : 500
Rack travel in m: 12.40...12.50
4th speed rpm : 890
Rack travel in m: 12.00...12.20

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 12.40...12.50

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.40...10.50
2nd pressure hPa : 400
Rack travel in m: 11.70...11.80
3rd pressure hPa : 210
Rack travel in m: 10.80...11.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 600
Del.quantity cm3/ : 92.0...94.0
1000 s: (89.5...96.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 59.5...61.5
1000 s: (57.5...63.5)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 10.60
Speed rpm : 1220...1230

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 128.0...138.0
1000 s: (125.0...141.0)
Rack travel in mm : 19.50...21.00

Remarks:

APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 6,1 r
Edition : 17.05.90
Replaces : 3.11.89
Test oil : ISO-4113

Combination no. : 0 400 866 125

Injection pump
Pump designation : PES6A85D410/3RS2761
EP type number : 0 410 886 895
Governor
Governor design. : RSV325...1150A8C674-
1L
Governor no. : 0 420 232 518

Customer-spec. information
Customer : KHD

Engine : BF6L913

1st version kW : 112.0
Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60
: (2.45...2.65)

Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 8.4...8.5

100 s: (8.2...8.7)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 7.5...7.7

Del.quantity cm3/ : 0.9...1.5

100 s: (0.7...1.7)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 700

Del.quantity : 84.5...85.5

1000 : (82.5...87.5)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 98...106

Testing:

1st rack travel in: 11.10

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1225...1255

3rd rack travel in: 4.00
Speed rpm : 1240...1270
4th rack travel in: 1410
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 63...71
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 7.1

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 325
Rack travel in mm : 7.50...7.70
Rack travel in mm : 2.00
Speed rpm : 430...490

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 12.10...12.20
2nd speed rpm : 500
Rack travel in m: 12.60...12.70
3rd speed rpm : 855
Rack travel in m: 12.30...12.50

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.50...11.60

Measurement

Speed 1/min : 500

1st pressure hPa : 350
Rack travel in m: 11.90...12.00
3rd pressure hPa : 700
Rack travel in m: 12.60...12.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 750
Del.quantity cm³/ : 87.0...89.0
1000 s: (84.5...91.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 64.5...65.5
1000 s: (62.5...67.5)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.10
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 110.0...120.0
1000 s: (107.0...123.0)
Rack travel in mm : 17.00...17.40

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 6,1 r 1
 Edition : 17.05.90
 Replaces : 3.11.89
 Test oil : ISO-4113
 Combination no. : 0 400 866 126
 Injection pump
 Pump designation : PES6A85D410/3RS2761
 EP type number : 0 410 886 895
 Governor
 Governor design. : RSV325...1150A8C673-
 2L
 Governor no. : 0 420 232 519

Customer-spec. information
 Customer : KHD

Engine : BF6L913

1st version kW : 112.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60
 : (2.45...2.65)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 8.4...8.5

100 s: (8.2...8.7)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 7.5...7.7

Del.quantity cm3/ : 0.9...1.5

100 s: (0.7...1.7)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 84.5...85.5

1000 : (82.5...87.5)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 98...106

Testing:

1st rack travel in: 11.10

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1225...1255

3rd rack travel in: 4.00

Speed rpm : 1240...1270
4th rack travel in: 1410
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 63...71
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 7.1

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 325
Rack travel in mm : 7.50...7.70
Rack travel in mm : 2.00
Speed rpm : 430...490

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 12.10...12.20
2nd speed rpm : 500
Rack travel in m: 12.60...12.70
3rd speed rpm : 855
Rack travel in m: 12.30...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm³/ : 87.0...89.0
1000 s: (84.5...91.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.10
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 110.0...120.0
1000 s: (107.0...123.0)
Rack travel in mm : 17.00...17.40

Remarks:

: ORENSTEIN U. KOPPEL

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 6,1 r 2
 Edition : 17.05.90
 Replaces : 3.11.89
 Test oil : ISO-4113
 Combination no. : 0 400 866 127
 Injection pump
 Pump designation : PES6A85D410/3RS2761
 EP type number : 0 410 886 895
 Governor
 Governor design. : RSV325...1150A8C707-
 5L
 Governor no. : 0 420 232 517

Customer-spec. information
 Customer : KHD

Engine : BF6L913

1st version kW : 112.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60
 : (2.45...2.65)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1150
 Rack travel in mm : 12.10...12.20
 Del.quantity cm3/ : 8.4...8.5
 100 s: (8.2...8.7)
 Spread cm3 : 0.3
 100 s: (0.5)

2nd speed rpm : 325.0
 Rack travel in mm : 7.5...7.7
 Del.quantity cm3/ : 0.9...1.5
 100 s: (0.7...1.7)
 Spread cm3 : 0.2
 100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1150
 Aneroid pressure h: 700
 Del.quantity : 84.5...85.5
 1000 : (82.5...87.5)
 Spread cm3 : 3.00
 1000 : (5.00)

RATED SPEED

1st version
 Control lever
 position degrees: 98...106

Testing:
 1st rack travel in: 11.10
 Speed rpm : 1190...1200
 2nd rack travel in: 4.00
 Speed rpm : 1225...1255

3rd rack travel in: 4.00
Speed rpm : 1240...1270
4th rack travel in: 1410
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 63...71
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 7.1

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 325
Rack travel in mm : 7.50...7.70
Rack travel in mm : 2.00
Speed rpm : 430...490

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 12.10...12.20
2nd speed rpm : 500
Rack travel in m: 12.60...12.70
3rd speed rpm : 855
Rack travel in m: 12.30...12.50

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.50...11.60

Measurement

Speed 1/min : 500

1st pressure hPa : 350
Rack travel in m: 11.90...12.00
3rd pressure hPa : 700
Rack travel in m: 12.60...12.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 750
Del.quantity cm³/ : 87.0...89.0
1000 s: (84.5...91.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 64.5...65.5
1000 s: (62.5...67.5)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.10
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 110.0...120.0
1000 s: (107.0...123.0)
Rack travel in mm : 17.00...17.40

Remarks:

: VIBROMAX

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 l 3
Edition : 17.05.90
Replaces : 2.5.89
Test oil : ISO-4113

Combination no. : 0 400 866 1290A

Injection pump
Pump designation : PES6A100D320/3RS2763
EP type number : 0 410 806 006
Governor
Governor design. : RSV400...1200AOC2190
Governor no. : 0 420 233

Cust. part no. : 3913290

Customer-spec. information
Customer : C.D.C

Engine : 6 CT

1st version kW : 101.0
Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

H2O

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
: (2.75...3.00)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Phasing :
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.00...10.10

Del.quantity cm3/ : 8.7...8.9

100 s: (8.5...9.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0
Rack travel in mm : 5.4...5.6
Del.quantity cm3/ : 1.6...2.0
100 s: (1.3...2.2)
Spread cm3 : 0.3
100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3
Speed rpm : 800
Rack travel in mm : 0.30...0.70

Governor spring pre-tension
Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1200
Del.quantity : 87.5...89.5
1000 : (85.5...91.5)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 54...62

Testing:

1st rack travel in: 9.00
Speed rpm : 1240...1250
2nd rack travel in: 4.00
Speed rpm : 1315...1345
3rd rack travel in: 4.00
Speed rpm : 1315...1345
4th rack travel in: 1400
Speed rpm : 0.30...0.70

LOW IDLE 1

Control lever
position degrees: 32...40
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.0

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 400
Rack travel in mm : 5.40...5.60

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1200
Rack travel in m: 10.00...10.10
2nd speed rpm : 800
Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800
Del.quantity cm³/ : 87.5...91.5
1000 s: (85.5...93.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.00
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 150.0...170.0
1000 s: (145.0...175.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.40...5.60

Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

Adjust stop lever to 0.5...1.0 mm
before stop.

Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 L 4
 Edition : 17.05.90
 Replaces : 2.5.89
 Test oil : ISO-4113
 Combination no. : 0 400 866 12908
 Injection pump
 Pump designation : PES6A100D320/3RS2763
 EP type number : 0 410 806 006
 Governor
 Governor design. : RSV400...1200AOC2190
 Governor no. : 0 420 233

Cust. part no. : 3915977

Customer-spec. information
 Customer : C.D.C

Engine : 6 CT

1st version kW : 101.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 017

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness : 6.00X2.00X600
 x Length mm

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
 : (2.75...3.00)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Phasing :
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1200
 Rack travel in mm : 10.00...10.10
 Del.quantity cm3/ : 8.7...8.9
 100 s: (8.5...9.1)
 Spread cm3 : 0.3
 100 s: (0.6)

2nd speed rpm : 400.0
 Rack travel in mm : 5.4...5.6
 Del.quantity cm3/ : 1.6...2.0
 100 s: (1.3...2.2)
 Spread cm3 : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1200
 Del.quantity : 87.5...89.5
 1000 : (85.5...91.5)
 Spread cm3 : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 54...62

Testing:

1st rack travel in: 9.00
Speed rpm : 1240...1250
2nd rack travel in: 4.00
Speed rpm : 1315...1345
3rd rack travel in: 4.00
Speed rpm : 1315...1345
4th rack travel in: 1400
Speed rpm : 0.30...0.70

LOW IDLE 1

Control lever
position degrees: 32...40
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.0

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 400
Rack travel in mm : 5.40...5.60

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1200
Rack travel in m: 10.00...10.10
2nd speed rpm : 800
Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800
Del.quantity cm³/ : 87.5...91.5
1000 s: (85.5...93.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.00
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 150.0...170.0
1000 s: (145.0...175.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.40...5.60

Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

Adjust stop lever to 0.5...1.0 mm
before stop.

Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 l 5
Edition : 17.05.90
Replaces : 2.5.89
Test oil : ISO-4113

Combination no. : 0 400 866 1290C

Injection pump
Pump designation : PES6A100D320/3RS2763
EP type number : 0 410 806 006
Governor
Governor design. : RSV425...1100AOC2190
Governor no. : 0 420 233

Cust. part no. : 3915989

Customer-spec. information
Customer : C.D.C

Engine : 6 CT

1st version kW : 127.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
: (2.75...3.00)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing :

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.20...10.30

Del.quantity cm3/ : 9.3...9.5

100 s: (9.1...9.7)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 425.0

Rack travel in mm : 5.0...5.2

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 93.5...95.5

1000 : (91.5...97.5)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control Lever

position degrees: 45...53

Testing:

1st rack travel in: 9.20
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1200...1230
3rd rack travel in: 4.00
Speed rpm : 1200...1230
4th rack travel in: 1250
Speed rpm : 0.30...0.70

LOW IDLE 1

Control lever
position degrees: 25...33
Setting point w/out bumper spring
Speed rpm : 425
Rack travel in mm : 4.6

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 425
Rack travel in mm : 5.00...5.20

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 10.20...10.30
2nd speed rpm : 750
Rack travel in m: 12.00...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm³/ : 120.0...124.0
1000 s: (118.0...126.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.20
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 150.0...170.0
1000 s: (145.0...175.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 425
Rack travel in mm : 5.00...5.20

Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 6.00
1000 s: (8.00)

Remarks:

Adjust stop lever to 0.5...1.0 mm
before stop.

Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a63
Edition : 09.07.90
Replaces : 2.5.89
Test oil : ISO-4113

Combination no. : 0 400 866 132

Injection pump
Pump designation : PES6A100D320/3RS2691
EP type number : 9 410 230 025
Governor
Governor design. : RSV500...1250AOC2190
-28R
Governor no. : 0 420 233 231

Customer-spec. information
Customer : C.D.C.

Engine : 6 CT-I 8.3ltr.

1st version kW : 139.0
Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 11.40...11.50

Del.quantity cm3/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 500.0

Rack travel in mm : 5.5...5.7

Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension
Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 101.5...103.5

1000 : (99.5...105.5)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 43...51

Testing:

1st rack travel in: 10.40
Speed rpm : 1315...1325
2nd rack travel in: 4.00
Speed rpm : 1365...1375
3rd rack travel in: 4.00
Speed rpm : 1365...1395
4th rack travel in: 1400
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 19...27
Setting point w/out bumper spring
Speed rpm : 500
Rack travel in mm : 5.1

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 500
Rack travel in mm : 5.50...5.70

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.40
Speed rpm : 1315...1325

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 135.0...155.0
1000 s: (130.0...160.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 500
Rack travel in mm : 5.50...5.70
Del.quantity cm3/ : 13.0...17.0
1000 s: (10.5...19.5)
Spread cm3 : 6.00
1000 s: (8.00)

Remarks:

: C.D.C. # 3915687

Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

Adjust stop lever to 0.5...1.0 mm
before stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a64
Edition : 17.05.90
Replaces : 2.5.89
Test oil : ISO-4113

Combination no. : 0 400 866 132LA

Injection pump
Pump designation : PES6A100D320/3RS2691
EP type number : 9 410 230 025
Governor
Governor design. : RSV400...1050AOC2190
Governor no. : 9 420 234

Cust. part no. : 3915948

Customer-spec. information
Customer : C.D.C.

Engine : 6 C 8.3

1st version kW : 174.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test Lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Phasing :
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050
Rack travel in mm : 12.90...13.00
Del.quantity cm3/ : 12.9...13.1
100 s: (12.7...13.3)
Spread cm3 : 0.3
100 s: (0.6)

2nd speed rpm : 400.0
Rack travel in mm : 5.8...6.0
Del.quantity cm3/ : 1.6...2.0
100 s: (1.3...2.2)
Spread cm3 : 0.3
100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3
Speed rpm : 800
Rack travel in mm : 0.30...0.70

Governor spring pre-tension
Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1050
Del.quantity : 129.0...131.0
1000 : (127.0...133.0)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 37...45

Testing:

1st rack travel in: 11.90
Speed rpm : 1095...1105
2nd rack travel in: 4.00
Speed rpm : 1170...1200
3rd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1250
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 18...26
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.4

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 400
Rack travel in mm : 5.80...6.00

BREAKAWAY

1st version
1mm rack travel less than

full load rack travel: 11.90
Speed rpm : 1095...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 135.0...155.0
1000 s: (130.0...160.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.80...6.00
Del. quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

Adjust stop lever to 0.5...1.0 mm
before stop.

Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 5,9 v 2
Edition : 31.07.90
Replaces : 24.5.89
Test oil : ISO-4113

Combination no. : 0 400 866 143

Injection pump
Pump designation : PES6A95D120RS2773
EP type number : 0 410 896 904
Governor
Governor design. : RSV350...1250AOC2237
R
Governor no. : 0 420 233 240

Customer-spec. information
Customer : CUMMINS

Engine : 6BT

1st version kW : 118.0
Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.10...2.20
: (2.05...2.25)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1250
Rack travel in mm : 9.40...9.50
Del.quantity cm3/ : 8.6...8.8
100 s: (8.3...9.0)
Spread cm3 : 0.3
100 s: (0.6)

2nd speed rpm : 350.0
Rack travel in mm : 6.1...6.3
Del.quantity cm3/ : 1.0...1.6
100 s: (0.7...1.8)
Spread cm3 : 0.3
100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3
Speed rpm : 800
Rack travel in mm : 0.30...0.70

Governor spring pre-tension
Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1250
Del.quantity : 86.0...88.0
1000 : (83.5...90.5)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 91...99

Testing:
1st rack travel in: 8.40
Speed rpm : 1290...1300

2nd rack travel in: 4.00
Speed rpm : 1355...1385
3rd rack travel in: 4.00
Speed rpm : 1370...1400
4th rack travel in: 1530
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.0

Testing:

Speed rpm : 100
Minimum rack trave: 19.50
Speed rpm : 350
Rack travel in mm : 5.40...5.60
Rack travel in mm : 2.00
Speed rpm : 465...525

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1250
Rack travel in m: 9.40...9.50
2nd speed rpm : 500
Rack travel in m: 9.40...9.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500
Del.quantity cm3/ : 69.5...72.5
1000 s: (67.5...74.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.40
Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 107.0...117.0
1000 s: (104.0...120.0)
Rack travel in mm : 14.10...14.50

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.10...6.30
Del.quantity cm3/ : 10.0...16.0
1000 s: (7.5...18.5)

Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark 11.5° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 L10
Edition : 09.07.90
Replaces : 6.3.90
Test oil : ISO-4113

Combination no. : 0 400 866 148

Injection pump
Pump designation : PES6A100D320/3RS2763
EP type number : 0 410 806 006
Governor
Governor design. : RSV415...1175A0C2190
-43R
Governor no. : 0 420 233 249

Customer-spec. information
Customer : C.D.C

Engine : 6 CT

1st version kW : 129.0
Rated speed : 2350

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1175

Rack travel in mm : 10.40...10.50

Del.quantity cm³/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm³ : 0.4

100 s: (0.6)

2nd speed rpm : 415.0

Rack travel in mm : 5.1...5.3

Del.quantity cm³/ : 1.5...1.9

100 s: (1.3...2.1)

Spread cm³ : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1175

Del.quantity : 96.0...98.0

1000 : (94.0...100.0)

Spread cm³ : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 56...64

Testing:

1st rack travel in: 9.40

Speed rpm : 1240...1250

2nd rack travel in: 4.00

Speed rpm : 1295...1325
3rd rack travel in: 4.00
Speed rpm : 1300...1330
4th rack travel in: 1350
Speed rpm : 0.30...0.70

LOW IDLE 1

Control lever
position degrees: 32...40
Setting point w/out bumper spring
Speed rpm : 415
Rack travel in mm : 4.7

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 415
Rack travel in mm : 5.10...5.30

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1175
Rack travel in m: 10.40...10.50
2nd speed rpm : 800
Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800
Del.quantity cm³/ : 98.0...102.0
1000 s: (96.0...104.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 145.0...165.0
1000 s: (140.0...170.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 415
Rack travel in mm : 5.10...5.30
Del.quantity cm³/ : 15.0...19.0
1000 s: (13.0...21.0)
Spread cm³ : 6.00
1000 s: (8.00)

Remarks:

: C.D.C. # 3919459

Adjust stop lever to 0.5...1.0 mm
before stop.

Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

Adjustment without torque-control
spring retainer with 1 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 L12
 Edition : 09.07.90
 Replaces : 2.5.90
 Test oil : ISO-4113
 Combination no. : 0 400 866 149
 Injection pump
 Pump designation : PES6A100D320/3RS2763
 EP type number : 0 410 806 006
 Governor
 Governor design. : RSV375...1000A0C2190
 -44R
 Governor no. : 0 420 233 250

Customer-spec. information
 Customer : C.D.C.

Engine : 6 CTA

1st version kW : 166.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 017

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 13.2...13.4

100 s: (13.0...13.6)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 375.0
 Rack travel in mm : 5.3...5.5
 Del.quantity cm3/ : 1.4...1.8
 100 s: (1.2...2.0)
 Spread cm3 : 0.6
 100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3

Speed rpm : 800
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1000
 Del.quantity : 132.5...134.5
 1000 : (130.5...136.5)
 Spread cm3 : 4.00
 1000 : (6.50)

RATED SPEED

1st version
 Control lever
 position degrees: 37...45

Testing:

1st rack travel in: 11.90
Speed rpm : 1050...1060
2nd rack travel in: 4.00
Speed rpm : 1115...1145
3rd rack travel in: 4.00
Speed rpm : 1120...1150
4th rack travel in: 1200
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 15...23
Setting point w/out bumper spring
Speed rpm : 375
Rack travel in mm : 4.9

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 375
Rack travel in mm : 5.30...5.50

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 12.90...13.00
2nd speed rpm : 750
Rack travel in m: 13.60...13.80

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm3/ : 141.5...145.5
1000 s: (139.5...147.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.90
Speed rpm : 1050...1060

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 145.0...165.0
1000 s: (140.0...170.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 375
Rack travel in mm : 5.30...5.50
Del.quantity cm3/ : 14.0...18.0
1000 s: (12.0...20.0)

Spread cm3 : 6.00
1000 s: (8.00)

Remarks:

: C.D.C. # 3915570

Adjustment without torque-control
spring retainer with 1 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

Adjust stop lever to 0.5...1.0 mm
before stop.

Start-of-delivery mark at 10° cam
rotation angle after start of delivery,
cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 o
Edition : 09.07.90
Replaces : 1.2.90
Test oil : ISO-4113

Combination no. : 0 400 866 151

Injection pump
Pump designation : PES6A100D320/3RS2691
-4

EP type number : 9 410 230 030

Governor

Governor design. : RSV450...1100AOC2238
R

Governer no. : 0 420 233 254

Customer-spec. information

Customer : C.D.C.

Engine : 6CT830

1st version kW : 151.0

Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
: (2.75...2.95)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 11.8...12.0

100 s: (11.6...12.2)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 450.0

Rack travel in mm : 5.7...5.9

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 118.5...120.5

1000 : (116.5...122.5)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 42...50

Testing:

1st rack travel in: 11.10
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1190...1220
3rd rack travel in: 4.00
Speed rpm : 1195...1225
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 22...30
Setting point w/out bumper spring
Speed rpm : 450
Rack travel in mm : 5.3

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 450
Rack travel in mm : 5.70...5.90

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 12.10...12.20
2nd speed rpm : 750
Rack travel in m: 13.10...13.30

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 13.10...13.30

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.40...10.60
2nd pressure hPa : 385
Rack travel in m: 11.40...11.50
3rd pressure hPa : 560
Rack travel in m: 12.60...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 750
Del.quantity cm³/ : 133.0...137.0
1000 s: (131.0...139.0)
Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm³/ : 78.0...80.0
1000 s: (76.0...82.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.10
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...155.0
1000 s: (130.0...160.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 450
Rack travel in mm : 5.70...5.90
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 6.00
1000 s: (8.00)

Remarks:

: C.D.C. # 3915996

Adjustment without torque-control
spring retainer with 1 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

Adjust stop lever to 0.5...1.0 mm
before stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 5,9 v 1
 Edition : 31.07.90
 Replaces : 20.10.89
 Test oil : ISO-4113
 Combination no. : 0 400 866 157
 Injection pump
 Pump designation : PES6A95D120RS2773
 EP type number : 0 410 896 904
 Governor
 Governor design. : RSV350...1300A0C2237
 -1R
 Governor no. : 0 420 233 260

Customer-spec. information
 Customer : CUMMINS

Engine : 6BT 5.9

1st version kW : 108.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 017

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.10...2.20
 : (2.05...2.25)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 8.10...8.20

Del.quantity cm3/ : 7.5...7.7

100 s: (7.2...7.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Del.quantity : 75.0...77.0

1000 : (72.5...79.5)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control Lever

position degrees: 95...103

Testing:

1st rack travel in: 7.10

Speed rpm : 1340...1350

2nd rack travel in: 4.00
Speed rpm : 1405...1435
3rd rack travel in: 4.00
Speed rpm : 1410...1440
4th rack travel in: 1550
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever
position degrees: 76...84
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.5

Testing:

Speed rpm : 100
Minimum rack trave: 19.50
Speed rpm : 350
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 520...580

TORQUE CONTROL

Dimension a mm : 0.35
Torque control curve - 1st version
1st speed rpm : 1300
Rack travel in m: 8.10...8.20
2nd speed rpm : 500
Rack travel in m: 8.50...8.60
3rd speed rpm : 940
Rack travel in m: 8.30...8.50

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500
Del.quantity cm3/ : 56.0...59.0
1000 s: (54.0...61.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 7.10
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 100.0...110.0
1000 s: (97.0...113.0)
Rack travel in mm : 13.00...13.20

LOW IDLE

Speed rpm : 350

Rack travel in mm : 5.90...6.10
Del.quantity cm3/ : 10.0...16.0
1000 s: (7.5...18.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark 11.5° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a77
Edition : 08.06.90
Replaces : 6.3.90
Test oil : ISO-4113

Combination no. : 0 400 866 160

Injection pump
Pump designation : PES6A100D320/3RS2691
EP type number : 9 410 230 025
Governor
Governor design. : RSV470...1100AOC2190
-48R
Governor no. : 0 420 233 262

Customer-spec. information
Customer : C.D.C.

Engine : 6CT830

1st version kW : 150.6
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter
x Wall thickness : 6.00X2.00X600
x Length mm

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 11.4...11.6

100 s: (11.2...11.8)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 470.0
Rack travel in mm : 5.7...5.9
Del.quantity cm3/ : 1.6...2.0
100 s: (1.3...2.2)
Spread cm3 : 0.6
100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 114.0...116.0

1000 : (112.0...118.0)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 44...52

Testing:

1st rack travel in: 11.10
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1205...1235
3rd rack travel in: 4.00
Speed rpm : 1210...1240
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 26...34
Setting point w/out bumper spring
Speed rpm : 470
Rack travel in mm : 5.3

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 470
Rack travel in mm : 5.70...5.90

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 12.10...12.20
2nd speed rpm : 750
Rack travel in m: 12.40...12.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm³/ : 116.0...120.0
1000 s: (114.0...122.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.10
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 125.0...145.0
1000 s: (120.0...150.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 470
Rack travel in mm : 5.70...5.90
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)

Spread cm³ : 6.00
1000 s: (8.00)

Remarks:

: C.D.C. # 3917962

Adjustment without torque-control
spring retainer with 1 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

Start-of-delivery mark 11° cam angle
after start of delivery cyl. 1

Adjust stop lever to 0.5...1.0 mm
before stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a78
Edition : 09.07.90
Replaces : 2.5.90
Test oil : ISO-4113

Combination no. : 0 400 866 161

Injection pump
Pump designation : PES6A100D320/3RS2691
EP type number : 9 410 230 025
Governor
Governor design. : RSV400...1000AOC2190
-49R
Governor no. : 0 420 233 263

Customer-spec. information
Customer : C.D.C.

Engine : 6 CT 8.3

1st version kW : 151.4
Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 017

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test Lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 11.9...12.1

100 s: (11.7...12.3)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.6...5.8

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 119.0...121.0

1000 : (117.0...123.0)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 36...44

Testing:

1st rack travel in: 11.10
Speed rpm : 1050...1060
2nd rack travel in: 4.00
Speed rpm : 1100...1130
3rd rack travel in: 4.00
Speed rpm : 1105...1135
4th rack travel in: 1175
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 21...29
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.2

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 5.60...5.80

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.10
Speed rpm : 1050...1060

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...155.0
1000 s: (130.0...160.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.60...5.80
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 6.00
1000 s: (8.00)

Remarks:

: C.D.C. # 3915963

Adjust stop lever to 0.5...1.0 mm
before stop.

Start-of-delivery mark at 10° cam
rotation angle after start of delivery,
cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 6,2 e 8
 Edition : 31.07.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 866 163
 Injection pump
 Pump designation : PES6A90D320/3RS2660
 EP type number : 0 410 896 078
 Governor
 Governor design. : RSV325...1175A0C2247
 R
 Governor no. : 0 420 233 264

Customer-spec. information
 Customer : MWM

Engine : TD226B-6

1st version kW : 107.0
 Rated speed : 2350

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05
 : (2.90...3.10)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : -1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
 & maximum rack tra: 21.00
 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1175

Rack travel in mm : 10.30...10.40

Del.quantity cm3/ : 7.6...7.7

100 s: (7.4...7.9)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 6.7...6.9

Del.quantity cm3/ : 1.0...1.6

100 s: (0.8...1.8)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1175

Aneroid pressure h: 700

Del.quantity : 76.0...77.0

1000 : (74.0...79.0)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever
position degrees: 92...100

Testing:

1st rack travel in: 9.30
Speed rpm : 1215...1225
2nd rack travel in: 4.00
Speed rpm : 1240...1270
3rd rack travel in: 4.50
Speed rpm : 1255...1285
4th rack travel in: 1430
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 65...73
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 5.7

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 325
Rack travel in mm : 6.10...6.30
Rack travel in mm : 2.00
Speed rpm : 485...555

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1175
Rack travel in m: 10.30...10.40
2nd speed rpm : 500
Rack travel in m: 11.40...11.50
4th speed rpm : 880
Rack travel in m: 10.80...11.00

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 11.40...11.50

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.20...10.30
2nd pressure hPa : 275
Rack travel in m: 11.00...11.10
3rd pressure hPa : 210
Rack travel in m: 10.50...10.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 600
Del.quantity cm3/ : 79.0...81.0
1000 s: (76.5...83.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 60.0...61.0
1000 s: (58.0...63.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.30
Speed rpm : 1215...1225

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...140.0
1000 s: (127.0...143.0)
Rack travel in mm : 19.50...21.00

Remarks:

: RENAULT

APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MMM 6,2 e 9
 Edition : 29.06.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 866 164
 Injection pump
 Pump designation : PES6A90D320/3RS2660
 EP type number : 0 410 896 078
 Governor
 Governor design. : RSV325...1200A0C2249
 R
 Governor no. : 0 420 233 265

Customer spec. information
 Customer : MMM

Engine : TD2268-6

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05
 : (2.90...3.10)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : -1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
 & maximum rack tra: 21.00
 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.30...10.40

Del.quantity cm3/ : 7.6...7.7

100 s: (7.4...7.9)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Del.quantity cm3/ : 1.0...1.6
 100 s: (0.8...1.8)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del.quantity : 76.0...77.0

1000 : (74.0...79.0)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 95...103

Testing:

1st rack travel in: 9.30
Speed rpm : 1240...1250
2nd rack travel in: 4.50
Speed rpm : 1260...1290
3rd rack travel in: 4.50
Speed rpm : 1275...1305
4th rack travel in: 1450
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 67...75
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 6.3

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 325
Rack travel in mm : 6.70...6.90
Rack travel in mm : 2.00
Speed rpm : 485...545

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1200
Rack travel in m: 10.30...10.40
2nd speed rpm : 500
Rack travel in m: 11.40...11.50
4th speed rpm : 870
Rack travel in m: 10.80...11.00

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 11.40...11.50

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.20...10.30
2nd pressure hPa : 275
Rack travel in m: 11.00...11.10
3rd pressure hPa : 190
Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 600

Del.quantity cm3/ : 79.0...81.0
1000 s: (76.5...83.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 60.0...61.0
1000 s: (58.0...63.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.30
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 128.0...138.0
1000 s: (125.0...141.0)
Rack travel in mm : 19.50...21.00

Remarks:

: RENAULT

APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 6,2 e10
 Edition : 08.06.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 866 165
 Injection pump
 Pump designation : PES6A90D320/3RS2660
 EP type number : 0 410 896 078
 Governor
 Governor design. : RSV325...900A1C2250R
 Governor no. : 0 420 233 266

Customer-spec. information
 Customer : MWM

Engine : TD226B-6

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175
 Test lines : 1 680 750 014
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 2.95...3.05
 : (2.90...3.10)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : -1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
 & maximum rack tra: 21.00
 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 900
 Rack travel in mm : 12.00...12.10
 Del.quantity cm³/ : 9.4...9.5
 100 s: (9.2...9.7)
 Spread cm³ : 0.3
 100 s: (0.5)
 2nd speed rpm : 325.0
 Rack travel in mm : 7.0...7.2
 Del.quantity cm³/ : 1.0...1.6
 100 s: (0.8...1.8)
 Spread cm³ : 0.2
 100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 900
 Del.quantity : 94.5...95.5
 1000 : (92.5...97.5)
 Spread cm³ : 3.00
 1000 : (5.00)

RATED SPEED

1st version
 Control lever
 position degrees: 93...101

Testing:
 1st rack travel in: 11.00

Speed rpm : 940...950
2nd rack travel in: 4.00
Speed rpm : 970...1000
3rd rack travel in: 4.00
Speed rpm : 980...1010
4th rack travel in: 1145
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 69...77
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 5.5

Testing:

Speed rpm : 100
Minimum rack trave: 19.50
Speed rpm : 325
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 370...430

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 12.00...12.10
2nd speed rpm : 500
Rack travel in m: 12.00...12.20

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.00
Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 133.0...143.0
1000 s: (130.0...146.0)
Rack travel in mm : 19.50...21.00

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : STE 3,4 a
 Edition : 10.08.90
 Replaces : 11.7.88
 Test oil : ISO-4113
 Combination no. : 0 400 874 245
 Injection pump
 Pump designation : PES4A85D410RS2746
 EP type number : 0 410 884 946
 Governor
 Governor design. : RSV300...1100A1C2227
 L
 Governor no. : 0 420 232 491

Customer-spec. information
 Customer : STEYR

Engine : WD411.87/88/91

1st version kW : 57.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.85...2.95
 : (2.80...3.00)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.40...10.50

Del.quantity cm3/ : 6.7...6.8

100 s: (6.5...7.0)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.3

Del.quantity cm3/ : 1.0...1.6

100 s: (0.8...1.7)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 67.5...68.5

1000 : (65.5...70.5)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 106...114

Testing:

1st rack travel in: 9.40

Speed rpm : 1140...1150

2nd rack travel in: 4.00

Speed rpm : 1155...1185
3rd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1335
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 71...79
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.7

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 300
Rack travel in mm : 6.10...6.30
Rack travel in mm : 2.00
Speed rpm : 365...425

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 10.40...10.50
2nd speed rpm : 500
Rack travel in m: 11.30...11.40
4th speed rpm : 915
Rack travel in m: 10.80...11.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm³/ : 65.0...67.0
1000 s: (62.5...69.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 95.0...105.0
1000 s: (92.0...108.0)
Rack travel in mm : 19.50...21.00

Remarks:

:

APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 6,1 e 7
 Edition : 08.06.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 876 240
 Injection pump
 Pump designation : PES6A95D41ORS2471
 EP type number : 0 410 896 952
 Governor
 Governor design. : RSV325...1400A8C674-
 5L
 Governor no. : 0 420 232 545

Customer spec. information
 Customer : KHD

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175
 Test lines : 1 680 750 014
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 1.90...2.00
 : (1.85...2.05)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1400
 Rack travel in mm : 9.20...9.30
 Del.quantity cm3/ : 8.5...8.7
 100 s: (8.3...8.9)
 Spread cm3 : 0.3
 100 s: (0.6)
 2nd speed rpm : 325.0
 Rack travel in mm : 6.4...6.6

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00
 Governor spring pre-tension
 Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1400
 Aneroid pressure h: 500
 Del.quantity : 85.5...87.5
 1000 : (83.5...89.5)
 Spread cm3 : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 59...67

Testing:
 1st rack travel in: 8.20
 Speed rpm : 1440...1450
 2nd rack travel in: 4.00
 Speed rpm : 1455...1485
 3rd rack travel in: 4.00
 Speed rpm : 1475...1505
 4th rack travel in: 1640
 Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
 position degrees: 13...21
 Setting point w/out bumper spring

Speed rpm : 325
Rack travel in mm : 6.0

Testing:

Speed rpm : 100
Minimum rack trave: 19.50
Speed rpm : 325
Rack travel in mm : 6.40...6.60
Rack travel in mm : 2.00
Speed rpm : 555...615

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1400
Rack travel in m: 9.20...9.30
2nd speed rpm : 500
Rack travel in m: 10.50...10.60
4th speed rpm : 1045
Rack travel in m: 9.80...10.00

RACK STOP ADJUSTMENT

Speed rpm : 500

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 8.20
Speed rpm : 1440...1450

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 116.5...126.5
1000 s: (113.5...129.5)

Remarks:

:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

The stop position of the control rod
must be easily reached with the stop
lever

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 6,1 e 8
 Edition : 08.06.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 876 275
 Injection pump
 Pump designation : PES6A95D410RS2471
 EP type number : 0 410 896 952
 Governor
 Governor design. : RSV325...1150A8C674-3L
 Governor no. : 0 420 232 543

Customer-spec. information
 Customer : KHD

Engine : BF6L913C

1st version kW : 132.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00
 : (1.85...2.05)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 11.80...11.90

Del.quantity cm³/ : 10.8...11.0

100 s: (10.6...11.2)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 7.2...7.4

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.4)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 700

Del.quantity : 108.0...110.0

1000 : (106.0...112.0)

Spread cm³ : 3.00

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 102...110

Testing:

1st rack travel in: 10.80

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1235...1265

3rd rack travel in: 4.00
Speed rpm : 1285...1315
4th rack travel in: 1400
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 67...75
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 6.8

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 325
Rack travel in mm : 7.20...7.40
Rack travel in mm : 2.00
Speed rpm : 585...645

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 11.80...11.90
2nd speed rpm : 500
Rack travel in m: 11.80...12.00

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 11.80...11.90

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.80...10.00
2nd pressure hPa : 220
Rack travel in m: 11.20...11.30
3rd pressure hPa : 140
Rack travel in m: 10.90...11.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 850
Del.quantity cm³/ : 103.5...106.5
1000 s: (101.0...109.0)
1000 s: (7.)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 62.0...64.0
1000 s: (60.0...66.0)

RACK STOP ADJUSTMENT

Speed rpm : 500

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.80
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 120.0...130.0
1000 s: (117.0...133.0)
Rack travel in mm : 15.50...15.90

Remarks:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

The stop position of the control rod
must be easily reached with the stop
lever

APPLICATION

Installation 2300

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 1 o 5
 Edition : 08.06.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 876 305
 Injection pump
 Pump designation : PES6A95D410RS2625
 EP type number : 0 410 896 926
 Governor
 Governor design. : RSV325...1150A8C674-
 2L
 Governor no. : 0 420 232 542

Customer-spec. information
 Customer : KHD

Engine : BF6L913B

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00
 : (1.85...2.05)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 11.40...11.50

Del.quantity cm3/ : 8.0...8.2

100 s : (7.8...8.4)

Spread cm3 : 0.3

100 s : (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 7.2...7.4

Del.quantity cm3/ : 1.6...2.2

100 s : (1.3...2.4)

Spread cm3 : 0.3

100 s : (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 700

Del.quantity : 80.0...82.0

1000 : (78.0...84.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 96...104

Testing:

1st rack travel in: 10.40

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1205...1235

3rd rack travel in: 4.00

Speed rpm : 1265...1295

4th rack travel in: 1430

Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 61...69

Setting point w/out bumper spring

Speed rpm : 325

Rack travel in mm : 6.8

Speed rpm : 325

Rack travel in mm : 7.20...7.40

Rack travel in mm : 2.00

Speed rpm : 585...645

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 11.40...11.50

2nd speed rpm : 500

Rack travel in m: 12.10...12.20

3rd speed rpm : 1000

Rack travel in m: 11.80...12.00

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 700

Rack travel mm : 12.20...12.30

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 11.10...11.20

2nd pressure hPa : 355

Rack travel in m: 11.90...12.00

3rd pressure hPa : 200

Rack travel in m: 11.10...11.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 800

Del.quantity cm3/ : 83.0...86.0

1000 s: (80.5...88.5)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 56.5...59.5

1000 s: (54.5...61.5)

RACK STOP ADJUSTMENT

Speed rpm : 500

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.40

Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 116.5...126.5

1000 s: (113.5...129.5)

Rack travel in mm : 15.90...16.40

Remarks:

:

APPLICATION

Excavator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 6,2 o 3
 Edition : 29.05.90
 Replaces : 12.4.90
 Test oil : ISO-4113
 Combination no. : 0 400 876 327
 Injection pump
 Pump designation : PES6A95D320RS2693
 EP type number : 0 410 896 914
 Governor
 Governor design. : RSV300...1300AOC2195
 R
 Governor no. : 0 420 233 200

Customer-spec. information
 Customer : DAF

Engine : DNT 620

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175
 Test lines : 1 680 750 015
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
 : (1.95...2.15)
 Rack travel in mm : 7.50...10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
 & maximum rack tra: 21.00
 Difference ° CS : 2.50...3.50

BASIC SETTING

1st speed rpm : 850
 Rack travel in mm : 11.60...11.70
 Del.quantity cm3/ : 7.7...7.8
 100 s: (7.5...8.0)
 Spread cm3 : 0.3
 100 s: (0.6)
 2nd speed rpm : 300.0
 Rack travel in mm : 6.5...6.7
 Del.quantity cm3/ : 0.7...1.1
 100 s: (0.4...1.3)
 Spread cm3 : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 6.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 850
 Aneroid pressure h: 700
 Del.quantity : 77.5...78.5
 1000 : (75.5...80.5)
 Spread cm3 : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 108...116

Testing:

1st rack travel in: 9.70
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1400...1430
3rd rack travel in: 4.00
Speed rpm : 1425...1455
4th rack travel in: 1580
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 75...83
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.1

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 300
Rack travel in mm : 6.50...6.70
Rack travel in mm : 2.00
Speed rpm : 600...660

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1290
Rack travel in m: 10.70...10.80
2nd speed rpm : 500
Rack travel in m: 11.60...11.70
4th speed rpm : 1060
Rack travel in m: 11.00...11.20

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 700
Rack travel mm : 11.60...11.70

Measurement

Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 11.10...11.30
2nd pressure hPa : 250
Rack travel in m: 11.50...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 1290
Del.quantity cm³/ : 74.0...76.0
1000 s: (71.5...78.5)

Aneroid pressure h: -

Speed rpm : 600
Del.quantity cm³/ : 65.5...66.5
1000 s: (63.5...68.5)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.70
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 130.0...145.0
1000 s: (127.0...148.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.50...6.70
Del.quantity cm³/ : 7.0...11.0
1000 s: (4.5...13.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 6,2 o 2
 Edition : 29.05.90
 Replaces : 12.1.90
 Test oil : ISO-4113
 Combination no. : 0 400 876 332
 Injection pump
 Pump designation : PES6A95D320RS2693
 EP type number : 0 410 896 914
 Governor
 Governor design. : RSV300...1300ADC2206
 Governor no. : 0 420 233 204

Customer-spec. information
 Customer : DAF

Engine : DNTD 620

1st version kW : 110.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
 : (1.95...2.15)

Rack travel in mm : 7.50...10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
 & maximum rack tra: 21.00
 Difference ° CS : 2.50...3.50

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 6.5...6.6

100 s: (6.3...6.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm3/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Del.quantity : 65.5...66.5

1000 : (63.5...68.5)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever
position degrees: 108...116

Testing:

1st rack travel in: 9.20
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1400...1430
3rd rack travel in: 4.00
Speed rpm : 1425...1455
4th rack travel in: 1570
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 76...84
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.9

Testing:

Speed rpm : 100
Minimum rack trave: 19.50
Speed rpm : 300
Rack travel in mm : 6.30...6.50
Rack travel in mm : 2.00
Speed rpm : 590...650

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1290
Rack travel in m: 10.20...10.40
2nd speed rpm : 500
Rack travel in m: 10.80...10.90
4th speed rpm : 1005
Rack travel in m: 10.50...10.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1290
Del.quantity cm3/ : 69.0...71.0
1000 s: (66.5...73.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.20
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...145.0
1000 s: (127.0...148.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.30...6.50
Del.quantity cm3/ : 7.0...11.0
1000 s: (4.5...13.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FIA 5,9 c
Edition : 21.05.90
Replaces : 30.3.90
Test oil : ISO-4113

Combination no. : 0 400 876 349

Injection pump
Pump designation : PES6A90D410RS2757
EP type number : 0 410 896 086
Governor
Governor design. : RSV425...1000A1C2233
Governor no. : 0 420 232 496

Customer-spec. information
Customer : IVECO-FIAT

Engine : 8065.25.080

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
x Wall thickness : 6.00X2.00X600
x Length mm

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35
: (2.20...2.40)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.80...11.90

Del.quantity cm3/ : 9.0...9.1

100 s: (8.8...9.3)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 475.0

Rack travel in mm : 7.1...7.3

Del.quantity cm3/ : 1.0...1.6

100 s: (0.8...1.8)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 800

Del.quantity : 90.0...91.0

1000 : (88.0...93.0)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 101...109

Testing:

1st rack travel in: 10.80

Speed rpm : 1040...1050

2nd rack travel in: 4.00

Speed rpm : 1090...1120

3rd rack travel in: 4.00

Speed rpm : 1140...1170
4th rack travel in: 1240
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 77...85
Setting point w/out bumper spring
Speed rpm : 475
Rack travel in mm : 6.7

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 475
Rack travel in mm : 6.60...6.80
Rack travel in mm : 2.00
Speed rpm : 610...670

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 11.80...11.90
2nd speed rpm : 500
Rack travel in m: 11.80...12.00

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.30...11.50
2nd pressure hPa : 780
Rack travel in m: 11.70...11.80

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 10.80
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 85.0...95.0
1000 s: (82.0...98.0)
Rack travel in mm : 19.50...21.00

Remarks:

:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

K07

On activation of the starting solenoid,
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 6,2 o 5
 Edition : 29.05.90
 Replaces : 12.1.90
 Test oil : ISO-4113
 Combination no. : 0 400 876 356
 Injection pump
 Pump designation : PES6A95D32ORS2693
 EP type number : 0 410 896 914
 Governor
 Governor design. : RSV300...1300AOC2195
 -1R
 Governor no. : 0 420 233 222

Customer spec. information
 Customer : DAF

Engine : DNT 620

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
 : (1.95...2.15)
 Rack travel in mm : 7.50...10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
 & maximum rack tra: 21.00
 Difference ° CS : 2.50...3.50

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 11.60...11.70

Del.quantity cm3/ : 7.7...7.8

100 s: (7.5...8.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.5...6.7

Del.quantity cm3/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 6.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 700

Del.quantity : 77.5...78.5

1000 : (75.5...80.5)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 106...114

Testing:

1st rack travel in: 9.70
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1400...1430
3rd rack travel in: 4.00
Speed rpm : 1425...1455
4th rack travel in: 1580
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever
position degrees: 75...83
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.1

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 300
Rack travel in mm : 6.50...6.70
Rack travel in mm : 2.00
Speed rpm : 600...660

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1290
Rack travel in m: 10.70...10.80
2nd speed rpm : 500
Rack travel in m: 11.60...11.70
4th speed rpm : 1060
Rack travel in m: 11.00...11.20

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 700
Rack travel mm : 11.60...11.70

Measurement

Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 11.10...11.30
2nd pressure hPa : 250
Rack travel in m: 11.50...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 1290
Del.quantity cm3/ : 74.0...76.0
1000 s: (71.5...78.5)

Aneroid pressure h: -

Speed rpm : 600
Del.quantity cm3/ : 65.5...66.5
1000 s: (63.5...68.5)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.70
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...145.0
1000 s: (127.0...148.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.50...6.70
Del.quantity cm3/ : 7.0...11.0
1000 s: (4.5...13.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 1 g 39
 Edition : 08.06.90
 Replaces : 3.11.89
 Test oil : ISO-4113
 Combination no. : 0 400 876 365
 Injection pump
 Pump designation : PES6A85D41ORS2761-1
 EP type number : 0 410 886 894
 Governor
 Governor design. : RSV325...1150A8C2020
 -1L
 Governor no. : 0 420 232 515

Customer-spec. information
 Customer : KHD

Engine : BF6L913

1st version kW : 110.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60
 : (2.45...2.65)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 12.00...12.10

Del.quantity cm3/ : 8.3...8.4

100 s: (8.1...8.6)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 7.3...7.5

Del.quantity cm3/ : 0.8...1.4

100 s: (0.6...1.6)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 700

Del.quantity : 83.5...84.5

1000 : (81.5...86.5)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 98...106

Testing:

1st rack travel in: 11.00

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1220...1250

3rd rack travel in: 4.00
Speed rpm : 1240...1270
4th rack travel in: 1405
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 63...71
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 6.9

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 325
Rack travel in mm : 7.30...7.50
Rack travel in mm : 2.00
Speed rpm : 420...480

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 12.00...12.10
2nd speed rpm : 750
Rack travel in m: 12.90...13.00
3rd speed rpm : 890
Rack travel in m: 12.30...12.50

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.50...11.60

Measurement

Speed 1/min : 500

1st pressure hPa : 300
Rack travel in m: 11.80...12.00
3rd pressure hPa : 700
Rack travel in m: 12.90...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 750
Del.quantity cm³/ : 89.0...91.0
1000 s: (86.5...93.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 64.5...65.5
1000 s: (62.5...67.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.00
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 110.0...120.0
1000 s: (107.0...123.0)
Rack travel in mm : 17.00...17.40

Remark : : DX6.60

APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 7,6 h15
 Edition : 17.05.90
 Replaces : 2.5.90
 Test oil : ISO-4113
 Combination no. : 0 400 876 371
 Injection pump
 Pump designation : PES6A100D410RS2676-1
 EP type number : 9 410 230 024
 Governor
 Governor design. : RSV450...1050AOC2204
 -6L
 Governor no. : 0 420 232 539

Customer spec. information
 Customer : JOHN DEERE

Engine : 6466AT13

1st version kW : 120.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 27...29

Prestroke mm : 2.45...2.55
 : (2.40...2.60)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 10.10...10.20

Del.quantity cm3/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 450.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.7...2.1

100 s: (1.5...2.3)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 101.5...103.5

1000 : (99.5...105.5)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 35...43

Testing:

1st rack travel in: 9.10
Speed rpm : 1095...1105
2nd rack travel in: 4.00
Speed rpm : 1180...1190
3rd rack travel in: 4.00
Speed rpm : 1185...1215
4th rack travel in: 1350
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 19...27
Setting point w/out bumper spring
Speed rpm : 450
Rack travel in mm : 5.0

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 450
Rack travel in mm : 5.40...5.60

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 10.10...10.20
2nd speed rpm : 650
Rack travel in m: 10.80...11.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650
Del.quantity cm³/ : 112.0...116.0
1000 s: (110.0...118.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.10
Speed rpm : 1095...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 190.0...210.0
1000 s: (185.0...215.0)

LOW IDLE

Speed rpm : 450
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ : 17.5...21.5
1000 s: (15.5...23.5)

Spread cm³ : 6.00
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE44344
Start-of-delivery mark at control-rod
travel 10.5 mm and 15° after start of
delivery.

Starting/full-load transition speed
from holding magnet = 450 1/min.

APPLICATION

Excavator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 7,7 e 1
Edition : 08.08.90
Replaces : -
Test oil : ISO-4113

Combination no. : 0 400 876 372

Injection pump
Pump designation : PES6A100D410RS2764-1
EP type number : 0 410 806 007
Governor
Governor design. : RSV600...1100A2C2161
-7L
Governor no. : 0 420 232 540

Customer-spec. information
Customer : JOHN DEERE

Engine : 6466AZ003

1st version kW : 164.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 1 457 413 010

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 190...200

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness : 6.00X2.00X600
x Length mm

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.45...2.55
: (2.40...2.60)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 12.4...12.6

100 s: (12.2...12.8)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 600.0

Rack travel in mm : 6.0...6.2

Del.quantity cm3/ : 1.7...2.1

100 s: (1.5...2.3)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 124.5...126.5

1000 : (122.5...128.5)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever
position degrees: 37...45

Testing:

1st rack travel in: 12.00
Speed rpm : 1145...1155
2nd rack travel in: 4.00
Speed rpm : 1195...1205
3rd rack travel in: 4.00
Speed rpm : 1215...1245
4th rack travel in: 1350
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 19...27
Setting point w/out bumper spring
Speed rpm : 600
Rack travel in mm : 5.6

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 600
Rack travel in mm : 6.00...6.20

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.30...9.50

Measurement

Speed 1/min : 500

1st pressure hPa : 175
Rack travel in m: 10.30...10.40
2nd pressure hPa : 280
Rack travel in m: 12.10...12.50
3rd pressure hPa : 900
Rack travel in m: 13.00...13.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 68.0...72.0
1000 s: (66.0...74.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00
Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 180.0...200.0
1000 s: (175.0...205.0)

LOW IDLE

Speed rpm : 600
Rack travel in mm : 6.00...6.20
Del.quantity cm3/ : 17.0...21.0
1000 s: (15.0...23.0)
Spread cm3 : 6.00
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE44661
Start-of-delivery mark at control-rod
travel 10.5 mm and 15° after start of
delivery.

Starting/full-load transition speed
from holding magnet = 450 1/min.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 7,7 e 2
 Edition : 09.07.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 400 876 373
 Injection pump
 Pump designation : PES6A100D410RS2764-1
 EP type number : 0 410 806 007
 Governor
 Governor design. : RSV600...1100A2C2161
 -8L
 Governor no. : 0 420 232 541

Customer-spec. information
 Customer : JOHN DEERE

Engine : 6466AZ004

1st version kW : 150.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 190...200

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness : 6.00X2.00X600
 x Length mm

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.45...2.55
 : (2.40...2.60)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.30...12.40

Del.quantity cm3/ : 11.6...11.8

100 s: (11.4...12.0)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 600.0

Rack travel in mm : 6.3...6.5

Del.quantity cm3/ : 1.9...2.3

100 s: (1.7...2.5)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 116.0...118.0

1000 : (114.0...120.0)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever
position degrees: 41...49

Testing:

1st rack travel in: 11.30
Speed rpm : 1155...1165
2nd rack travel in: 4.00
Speed rpm : 1220...1230
3rd rack travel in: 4.00
Speed rpm : 1220...1250
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 22...30
Setting point w/out bumper spring
Speed rpm : 600
Rack travel in mm : 5.9

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 600
Rack travel in mm : 6.30...6.50

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 12.30...12.40
2nd speed rpm : 750
Rack travel in m: 13.90...14.10

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.60...9.80

Measurement

Speed 1/min : 500

1st pressure hPa : 95
Rack travel in m: 10.60...10.70
2nd pressure hPa : 200
Rack travel in m: 12.60...13.00
3rd pressure hPa : 900
Rack travel in m: 13.90...14.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 750

Del.quantity cm³/ : 138.5...142.5
1000 s: (136.5...144.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 70.5...74.5
1000 s: (68.5...76.5)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.30
Speed rpm : 1155...1165

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 180.0...200.0
1000 s: (175.0...205.0)

LOW IDLE

Speed rpm : 600
Rack travel in mm : 6.30...6.50
Del.quantity cm³/ : 19.0...23.0
1000 s: (17.0...25.0)
Spread cm³ : 6.00
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE44662
Start-of-delivery mark = 15.5° after
start of delivery cyl. 1.

Starting/full-load transition speed
from holding magnet = 450 1/min.

Adjustment without torque-control
spring retainer with 0,5 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : HAN 10,8 f6
 Edition : 17.05.90
 Replaces : 1.9.89
 Test oil : ISO-4113
 Combination no. : 0 401 076 009
 Injection pump
 Pump designation : PE6A100D32ORS3030-1
 EP type number : 0 411 006 019
 Governor
 Governor design. : RSV350...1100A8C2232
 R
 Governor no. : 0 420 233 218

Customer spec. information
 Customer : HANOMAG

Engine : D946T-70E

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test Lines : 1 680 750 003

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.80...1.90
 : (1.75...1.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50
 & maximum rack tra: 21.00
 Difference ° CS : 5.50...6.50

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 9.80...9.90

Del.quantity cm3/ : 12.6...12.8

100 s: (12.4...13.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 1.1...1.7

100 s: (0.8...1.9)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 700

Del.quantity : 126.0...128.0

1000 : (124.0...130.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 95...103

Testing:

1st rack travel in: 8.80
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1155...1185
3rd rack travel in: 4.00
Speed rpm : 1175...1205
4th rack travel in: 1340
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever
position degrees: 65...73
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.5

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 350
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 475...535

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 9.80...9.90
2nd speed rpm : 500
Rack travel in m: 10.60...10.70
3rd speed rpm : 915
Rack travel in m: 10.10...10.30

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 10.60...10.70

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.90...9.00
2nd pressure hPa : 450
Rack travel in m: 10.10...10.20
3rd pressure hPa : 290
Rack travel in m: 9.30...9.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm³/ : 89.0...91.0
1000 s: (87.0...93.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 8.80
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 220.0...235.0
1000 s: (217.0...238.0)
Rack travel in mm : 19.50...21.00

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : STE 12,0 g
Edition : 29.05.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 401 838 705
Injection pump
Pump designation : PE8P110A120LS3252
EP type number : 0 411 818 721
Governor
Governor design. : RQV250...1100PA951
Governor no. : 0 421 813 854

Customer-spec. information
Customer : STEYR

Engine : WD815.66

1st version kW : 270.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 4- 8- 6- 3-
7- 2

Phasing : 0-45-90-135-180-225-
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.10...13.20

Del.quantity cm3/ : 17.4...17.6

100 s: (17.1...17.9)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 3.7...3.9

Del.quantity cm3/ : 1.7...2.3

100 s: (1.5...2.5)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
travel mm : 0.90...1.30

2nd speed rpm : 450
travel mm : 2.80...3.40

3rd speed rpm : 700
travel mm : 4.50...5.10

4th speed rpm : 1145
travel mm : 8.40...8.60

5th speed rpm : 1230
travel mm : 10.10...10.50

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1140

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 174.0...176.0

1000 : (171.0...179.0)

Spread cm³ : 4.00
 1000 : (7.50)

RATED SPEED

1st version
Control lever
 position degrees: 113...121

Testing:
1st rack travel in: 12.10
 Speed rpm : 1140...1150
2nd rack travel in: 4.00
 Speed rpm : 1210...1240
4th rack travel in: 1350
 Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
 position degrees: 59...67

Testing:
Speed rpm : 100
Minimum rack trave: 5.00
Speed rpm : 250
Rack travel in mm : 3.70...3.90

CONSTANT REGULATION
Speed rpm : 250...390

TORQUE CONTROL
Dimension a mm : 0.30
Torque control curve - 1st version
1st speed rpm : 1100
 Rack travel in m: 13.10...13.20
2nd speed rpm : 600
 Rack travel in m: 13.40...13.50

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 13.40...13.50

Measurement
Speed 1/min : 500

1st pressure hPa : -
 Rack travel in m: 10.00...10.20
2nd pressure hPa : 600
 Rack travel in m: 12.50...12.60
3rd pressure hPa : 380
 Rack travel in m: 10.80...11.00

START CUT-OUT

Speed 1/min : 170 (190)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 600
Del.quantity cm³/ : 186.0...190.0
 1000 s: (183.0...193.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 117.0...119.0
 1000 s: (114.0...122.0)

BREAKAWAY

1st version
1mm rack travel less than

 full load rack tr: 12.10
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 220.0...260.0
 1000 s: (216.0...264.0)
Rack travel in mm : 20.00...21.00

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : STE 12,0 f
Edition : 29.05.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 401 838 707
Injection pump
Pump designation : PE8P110A120LS3252
EP type number : 0 411 818 721
Governor
Governor design. : RQ300/1100PA958
Governor no. : 0 421 801 522

Customer-spec. information
Customer : STEYR

Engine : WD815.66

1st version kW : 270.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 4- 8- 6- 3-
7- 2

Phasing : 0-45-90-135-180-225-
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.10...13.20

Del.quantity cm3/ : 17.4...17.6

100 s: (17.1...17.9)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 3.7...3.9

Del.quantity cm3/ : 1.7...2.3

100 s: (1.5...2.5)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 15.60...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 174.0...176.0

1000 : (171.0...179.0)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.0

Testing:

1st rack travel in: 12.10

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1200...1230
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 3.8

Testing:

Speed rpm : 100

Minimum rack travel: 5.20

Speed rpm : 300

Rack travel in mm : 3.70...3.90

Rack travel in mm : 2.00

Speed rpm : 340...380

TORQUE CONTROL

Dimension a mm : 0.30

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 13.10...13.20

2nd speed rpm : 600

Rack travel in m: 13.40...13.50

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 1200

Rack travel mm : 13.40...13.50

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 10.00...10.20

2nd pressure hPa : 600

Rack travel in m: 12.50...12.60

3rd pressure hPa : 380

Rack travel in m: 10.80...11.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 600

Del.quantity cm3/ : 186.0...190.0

1000 s: (183.0...193.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 117.0...119.0

1000 s: (114.0...122.0)

BREAKAWAY

K23

1st version

1mm rack travel less than

full load rack tr: 12.10

Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 220.0...260.0

1000 s: (216.0...264.0)

Rack travel in mm : 20.00...21.00

Remarks:

:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,8 f 2
 Edition : 08.06.90
 Replaces : 7.4.89
 Test oil : ISO-4113
 Combination no. : 0 401 846 398
 Injection pump
 Pump designation : PE6P110A72ORS371-1
 EP type number : 0 411 816 166
 Governor
 Governor design. : RQ300/1100PA424-1
 Governor no. : 0 421 801 395

Customer spec. information
 Customer : MERCEDES-BENZ

Engine : OM355A

1st version kW : 206.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.70...11.80

Del. quantity cm3/ : 16.0...16.2

100 s: (15.7...16.4)

Spread cm3 : 0.4

100 s: (0.8)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del. quantity cm3/ : 1.4...2.0

100 s: (1.1...2.2)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 650

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 700

Del. quantity : 160.0...162.0

1000 : (157.5...164.5)

Spread cm3 : 4.00

1000 : (8.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 650

Rack travel in mm : 20.0

Testing:

1st rack travel in: 10.70

Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1190...1220
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300
Rack travel in mm : 6.2

Testing:

Speed rpm : 100
Minimum rack travel: 8.20
Speed rpm : 300
Rack travel in mm : 6.10...6.30
Rack travel in mm : 2.00
Speed rpm : 410...450

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100
Rack travel in m: 11.70...11.80
2nd speed rpm : 650
Rack travel in m: 11.70...11.90

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 11.70...11.80

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 11.00...11.10
2nd pressure hPa : 390
Rack travel in m: 11.50...11.60
3rd pressure hPa : 350
Rack travel in m: 11.20...11.30

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 600
Del.quantity cm3/ : 156.0...160.0
1000 s: (153.0...163.0)
Spread cm3 : 6.00
1000 s: (9.00)

Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm3/ : 135.0...137.0
1000 s: (132.0...140.0)
Spread cm3 : 6.00
1000 s: (9.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.70
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 120.0...145.0
1000 s: (116.0...149.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,6 x4
 Edition : 10.08.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 846 472Z
 Injection pump
 Pump designation : PE6P110A320RS407-1
 EP type number : 0 411 816 147
 Governor
 Governor design. : RQ275/1000PA641
 Governor no. : 0 421 801 174

Customer spec. information
 Customer : DAF

Engine : DKFL1160

1st version kW : 191.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 600
 Rack travel in mm : 12.80...12.90
 Del.quantity cm3/ : 15.1...15.3
 100 s: (14.9...15.6)
 Spread cm3 : 0.4
 100 s: (0.7)

2nd speed rpm : 275.0
 Rack travel in mm : 7.0...7.2
 Del.quantity cm3/ : 0.9...1.4
 100 s: (0.6...1.6)
 Spread cm3 : 0.4
 100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 600
 Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 600
 Aneroid pressure h: 700
 Del.quantity : 151.5...153.5
 1000 : (149.0...156.0)
 Spread cm3 : 4.00
 1000 : (7.50)

RATED SPEED

1st version

Setting point:
 Speed rpm : 600
 Rack travel in mm : 15.8

Testing:
 1st rack travel in: 11.10
 Speed rpm : 1045...1060
 2nd rack travel in: 4.00
 Speed rpm : 1110...1140
 4th rack travel in: 1300
 Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 275

Rack travel in mm : 7.1

Testing:

Speed rpm : 100

Minimum rack travel: 8.60

Speed rpm : 275

Rack travel in mm : 7.00...7.20

Rack travel in mm : 2.00

Speed rpm : 350...390

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 600

Rack travel in m: 13.00...13.10

2nd speed rpm : 1000

Rack travel in m: 12.10...12.30

3rd speed rpm : 790

Rack travel in m: 12.60...12.80

4th speed rpm : 865

Rack travel in m: 12.20...12.50

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 600

Pressure hPa : 700

Rack travel mm : 12.80...12.90

Measurement

Speed 1/min : 600

1st pressure hPa : -

Rack travel in m: 10.50...10.60

2nd pressure hPa : 190

Rack travel in m: 12.30...12.40

3rd pressure hPa : 130

Rack travel in m: 11.10...11.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 1000

Del.quantity cm³/ : 137.0...139.0

1000 s: (134.0...142.0)

Aneroid pressure h: -

Speed rpm : 600

Del.quantity cm³/ : 102.0...104.0

1000 s: (99.5...106.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.10

Speed rpm : 1045...1060

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm³/ : 245.0...285.0

1000 s: (241.0...289.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 275

Rack travel in mm : 7.00...7.20

Del.quantity cm³/ : 9.0...14.0

1000 s: (6.5...16.5)

Spread cm³ : 4.50

1000 s: (7.50)

TESTING & SETTING

RACK TRAVEL SENSOR

Supply voltage : 24.0

Speed rpm : 600

Pressure hPa : 700

Set quantity with control lever

cm³/ : 11.5...11.6

Voltage : 2,800...2,820

volt : (2,790...2,830)

Rack travel in mm : 6.00...6.10

Voltage : 1,690...1,730

volt : (1,680...1,740)

Remarks:

:

The stop position of the control rod must be easily reached with the stop lever

On activation of the starting solenoid, the start position must be reached.

APPLICATION

Omnibus

Speed rpm : 1140...1170
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 6...14

Testing:

Speed rpm : 100
Minimum rack travel: 6.40
Speed rpm : 250
Rack travel in mm : 4.80...5.10

CONSTANT REGULATION

Speed rpm : 250...400

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 14.00...14.10

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in mm: 10.00...10.20

2nd pressure hPa : 120

Rack travel in mm: 0.20...0.30

3rd pressure hPa : 810

Rack travel in mm: 3.30...3.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700

Del.quantity cm³/ : 163.0...165.0

1000 s: (160.0...168.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.00

Speed rpm : 1055...1065

STARTING FUEL DELIVERY

Speed rpm : 100

L01

Del.quantity cm³/ : 220.0...240.0
1000 s: (216.0...244.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 4.80...5.10
Del.quantity cm³/ : 18.0...23.0
1000 s: (15.5...25.5)
Spread cm³ : 5.00
1000 s: (7.00)

Remarks:

:
Delivery-valve spring pre-tension =
2.40...2.60 mm.
Permissible alteration from 2.20...2.90
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 d8
 Edition : 06.07.90
 Replaces : 11.5.89
 Test oil : ISO-4113

Combination no. : 0 401 846 874

Injection pump
 Pump designation : PE6P120A32ORS3183
 EP type number : 0 411 826 754
 Governor
 Governor design. : RQ250/1000PA832
 Governor no. : 0 421 801 368

Customer-spec. information
 Customer : DAF

Engine : WS 259

1st version kW : 259.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80
 : (3.65...3.85)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.80...12.90

Del.quantity cm³/ : 21.3...21.5

100 s: (21.0...21.8)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 6.6...7.0

Del.quantity cm³/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm³ : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 213.0...215.0

1000 : (210.0...218.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 11.80

Speed rpm : 1035...1050

2nd rack travel in: 4.00

Speed rpm : 1125...1155
4th rack travel in: 1250
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 6.8

Testing:

Speed rpm : 100
Minimum rack trave: 8.30
Speed rpm : 250
Rack travel in mm : 6.60...7.00
Rack travel in mm : 2.00
Speed rpm : 350...390

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 13.10...13.20
2nd speed rpm : 1000
Rack travel in m: 13.00...13.20

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 600
Pressure hPa : 1000
Rack travel mm : 12.80...12.90

Measurement

Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 10.20...10.40
2nd pressure hPa : 460
Rack travel in m: 12.20...12.30
3rd pressure hPa : 250
Rack travel in m: 10.80...11.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 600
Del.quantity cm3/ : 145.0...147.0
1000 s: (142.0...150.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.80
Speed rpm : 1035...1050

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 260.0...300.0
1000 s: (256.0...304.0)

LOW IDLE

Speed rpm : 250
Rack travel in mm : 6.60...7.00
Del.quantity cm3/ : 14.0...20.0
1000 s: (11.0...23.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,6 p 3
Edition : 07.07.90
Replaces : 2.2.90
Test oil : ISO-4113

Combination no. : 0 401 878 707

Injection pump
Pump designation : PE8P120A320LS3816-10
EP type number : 0 411 828 715
Governor
Governor design. : RSV350...750POA824-3
Governor no. : 0 421 833 229

Customer-spec. information
Customer : MERCEDES-BENZ

Engine : OM422A

1st version kW : 227.0
Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 1 417 413 025

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 100...120

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10
: (3.95...4.15)
Rack travel in mm : 9.00...12.00
Firing order : 8- 7- 2- 6- 3- 5-
4- 1

Phasing : 0-45-90-135-180-225-
270-315
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 18.4...18.6
100 s: (18.1...18.9)

Spread cm3 : 0.5
100 s: (0.9)

2nd speed rpm : 350.0
Rack travel in mm : 5.3...5.6
Del.quantity cm3/ : 1.6...2.2
100 s: (1.3...2.5)
Spread cm3 : 0.8
100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3
Speed rpm : 800
Rack travel in mm : 0.30...1.00

Governor spring pre-tension
Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 700
Del.quantity : 184.0...186.0
1000 : (181.0...189.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 26...30

Testing:
1st rack travel in: 11.10
Speed rpm : 750...755
2nd rack travel in: 4.00
Speed rpm : 780...793

LOW IDLE 1
Control lever
position degrees: 12...20
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.4

Testing:
Speed rpm : 100
Minimum rack trave: 19.50
Speed rpm : 350
Rack travel in mm : 5.30...5.60

SET IDLE AUXILIARY SPRING
Rack travel in mm : 2.00

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.10
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 170.0...190.0
1000 s: (166.0...194.0)

Remarks:

Observe VDT-I-420/120

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9a13
 Edition : 15.12.89
 Replaces : 31.7.87
 Test oil : ISO-4113
 Combination no. : 0 402 036 044
 Injection pump
 Pump designation : PES6P120A720/3LS470-
 2
 EP type number : 0 412 026 050
 Governor
 Governor design. : RQ300/1100PA658-19
 Governor no. : 0 421 801 323

Customer-spec. information
 Customer : MAN

Engine : D2866LFZ

1st version kW : 243.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.80...2.90
 : (2.75...2.95)

Rack travel in mm : 9.00...12.00
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 11.30...11.40

Del.quantity cm3/ : 20.7...20.9

100 s: (20.4...21.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.6...4.8

Del.quantity cm3/ : 1.2...1.8

100 s: (0.9...2.1)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Aneroid pressure h: 1000

Del.quantity : 207.0...209.0

1000 : (204.0...212.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.50

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1185...1215
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 4.7

Testing:

Speed rpm : 100
Minimum rack trave: 6.20
Speed rpm : 300
Rack travel in mm : 4.60...4.80
Rack travel in mm : 2.00
Speed rpm : 340...380

TORQUE CONTROL

Dimension a mm : 0.50
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 11.70...11.80
2nd speed rpm : 750
Rack travel in m: 11.90...12.20
3rd speed rpm : 875
Rack travel in m: 11.80...12.00
4th speed rpm : 950
Rack travel in m: 11.20...11.50

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 1000
Rack travel mm : 11.30...11.40

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.90...9.10
2nd pressure hPa : 85
Rack travel in m: 9.30...9.40
3rd pressure hPa : 280
Rack travel in m: 10.50...10.90

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 1100

Del.quantity cm3/ : 203.0...207.0
1000 s: (200.0...210.0)
Aneroid pressure h: 1000
Speed rpm : 650
Del.quantity cm3/ : 208.0...214.0
1000 s: (205.0...217.0)
Aneroid pressure h: 280
Speed rpm : 500
Del.quantity cm3/ : 184.0...196.0
1000 s: (181.0...199.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 132.0...134.0
1000 s: (129.0...137.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.50
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 225.0...245.0
1000 s: (221.0...249.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 4.60...4.80
Del.quantity cm3/ : 12.0...18.0
1000 s: (9.0...21.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

: MAN-NR. 2-7756

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9 u1
 Edition : 20.07.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 036 740
 Injection pump
 Pump designation : PES6P120A720/3LS3255
 EP type number : 0 412 026 741
 Governor
 Governor design. : RQ300/1000PA813-13
 Governor no. : 0 421 801 529

Customer-spec. information
 Customer : MAN

Engine : D2866LF03

1st version kW : 273.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)
 Rack travel in mm : 14.50...15.50
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 15.00...15.10

Del.quantity cm3/ : 24.2...24.4

100 s: (23.9...24.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.3

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 550

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1200

Del.quantity : 242.0...244.0

1000 : (239.0...247.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.80

Speed rpm : 1045...1060
2nd rack travel in: 4.00
Speed rpm : 1160...1190
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300
Rack travel in mm : 5.0

Testing:

Speed rpm : 200
Minimum rack travel: 6.50
Speed rpm : 300
Rack travel in mm : 4.90...5.10
Rack travel in mm : 2.00
Speed rpm : 360...400

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000
Rack travel in m: 14.80...14.90
2nd speed rpm : 700
Rack travel in m: 15.30...15.50

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 15.00...15.10

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 11.70...11.90
2nd pressure hPa : 110
Rack travel in m: 12.00...12.10
3rd pressure hPa : 470
Rack travel in m: 13.70...14.10

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 1000
Del.quantity cm3/ : 236.0...242.0
1000 s: (233.0...245.0)
Speed rpm : 700

Del.quantity cm3/ : 89.0...99.0
1000 s: (86.0...102.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 134.0...136.0
1000 s: (131.0...139.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.80
Speed rpm : 1045...1060

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 220.0...240.0
1000 s: (216.0...244.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 4.90...5.30
Del.quantity cm3/ : 17.0...23.0
1000 s: (14.0...26.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

: MAN-NR. 0-7050
Setting and blocking of pointer of
start-of-delivery sensor on cyl. 6
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9 u
 Edition : 19.06.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 036 741
 Injection pump
 Pump designation : PES6P120A720/3LS3255
 EP type number : 0 412 026 739
 Governor
 Governor design. : RQV300...1000PA876-6
 Governor no. : 0 421 813 866

Customer-spec. information
 Customer : MAN

Engine : D2866LF03

1st version kW : 273.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)
 Rack travel in mm : 14.50...15.50
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10
 & maximum rack tra: 14.5...15.5
 Difference ° CS : 2.00...4.00

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 15.00...15.10

Del.quantity cm3/ : 24.2...24.4

100 s: (23.9...24.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.7...5.1

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1045
 travel mm : 9.90...10.10

2nd speed rpm : 300
 travel mm : 1.50...1.70

3rd speed rpm : 500
 travel mm : 3.30...3.90

4th speed rpm : 800
 travel mm : 6.80...7.20

5th speed rpm : 1300
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1060

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700
Aneroid pressure h: 1200
Del.quantity : 242.0...244.0
1000 : (239.0...247.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 298...306

Testing:

1st rack travel in: 13.60
Speed rpm : 1040...1050
2nd rack travel in: 4.00
Speed rpm : 1125...1155
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 256...264

Testing:

Speed rpm : 200
Minimum rack travel: 6.40
Speed rpm : 300
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

Speed rpm : 290...400

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 700
Rack travel in m: 15.00...15.10
2nd speed rpm : 1000
Rack travel in m: 14.60...14.70

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 15.00...15.10

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 11.70...11.90

2nd pressure hPa : 110
Rack travel in m: 12.00...12.10
3rd pressure hPa : 470
Rack travel in m: 14.00...14.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 1000
Del.quantity cm³/ : 236.0...242.0
1000 s: (233.0...245.0)
Speed rpm : 700
Del.quantity cm³/ : 95.0...101.0
1000 s: (92.0...104.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 134.0...136.0
1000 s: (131.0...139.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.60
Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 210.0...230.0
1000 s: (206.0...234.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 4.70...5.10
Del.quantity cm³/ : 17.0...23.0
1000 s: (14.0...26.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: MAN-NR. 0-7051

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 6
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,1q29
 Edition : 07.08.90
 Replaces : 10.85
 Test oil : ISO-4113
 Combination no. : 0 402 046 204
 Injection pump
 Pump designation : PES6P120A72OLS388
 EP type number : 0 412 026 030
 Governor
 Governor design. : RQV250...1100PA504

Customer-spec. information
 Customer : MAN

Engine : D2566MKF

1st version kW : 206.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10
 : (2.95...3.15)
 Rack travel in mm : 9.00...12.00
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 11.40...11.50

Del.quantity cm3/ : 17.8...18.0

100 s: (17.5...18.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 6.2...6.4

Del.quantity cm3/ : 1.2...1.8

100 s: (0.9...2.1)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.80...2.10

2nd speed rpm : 800

travel mm : 5.30...5.60

3rd speed rpm : 1100

travel mm : 7.80...8.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Aneroid pressure h: 700

Del.quantity : 178.0...180.0

1000 : (175.0...183.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 62...70

Testing:

1st rack travel in: 9.20
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1210...1240
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 8...16

Testing:

Speed rpm : 100
Minimum rack travel: 7.80
Speed rpm : 250
Rack travel in mm : 6.20...6.40

CONSTANT REGULATION

Speed rpm : 365...480

TORQUE CONTROL

Dimension a mm : 1.20
Torque control curve - 1st version
1st speed rpm : 750
Rack travel in m: 11.40...11.50
2nd speed rpm : 1100
Rack travel in m: 10.20...10.30
3rd speed rpm : 900
Rack travel in m: 11.00...11.20
4th speed rpm : 1000
Rack travel in m: 10.30...10.60

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 11.40...11.50

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 9.20...9.30

2nd pressure hPa : 310

Rack travel in m: 10.30...10.40

3rd pressure hPa : 430

Rack travel in m: 10.90...11.10

START CUT-OUT

Speed 1/min : 170 (190)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 1100
Del.quantity cm³/ : 160.0...166.0
1000 s: (157.0...169.0)
Aneroid pressure h: 700
Speed rpm : 650
Del.quantity cm³/ : 171.0...177.0
1000 s: (168.0...180.0)
Aneroid pressure h: 310
Speed rpm : 500
Del.quantity cm³/ : 131.0...137.0
1000 s: (128.0...140.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 104.0...106.0
1000 s: (101.0...109.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.20
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 205.0...225.0
1000 s: (201.0...229.0)

LOW IDLE

Speed rpm : 250
Rack travel in mm : 6.20...6.40
Del.quantity cm³/ : 12.0...18.0
1000 s: (9.0...21.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: MAN-NR. 2-7113

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,1q33
 Edition : 07.08.90
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 046 205
 Injection pump
 Pump designation : PES6P120A720LS388
 EP type number : 0 412 026 030
 Governor
 Governor design. : RQV250...1100PA504

Customer-spec. information
 Customer : MAN

Engine : D2566MKF

1st version kW : 206.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10
 : (2.95...3.15)
 Rack travel in mm : 9.00...12.00
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 11.40...11.50

Del.quantity cm3/ : 17.8...18.0

100 s: (17.5...18.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 6.2...6.4

Del.quantity cm3/ : 1.2...1.8

100 s: (0.9...2.1)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 1.80...2.10

2nd speed rpm : 800
 travel mm : 5.30...5.60

3rd speed rpm : 1100
 travel mm : 7.80...8.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Aneroid pressure h: 700

Del.quantity : 178.0...180.0

1000 : (175.0...183.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 62...70

Testing:

1st rack travel in: 9.20
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1210...1240
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 8...16

Testing:

Speed rpm : 100
Minimum rack travel: 7.80
Speed rpm : 250
Rack travel in mm : 6.20...6.40

CONSTANT REGULATION

Speed rpm : 365...480

TORQUE CONTROL

Dimension a mm : 1.20
Torque control curve - 1st version
1st speed rpm : 750
Rack travel in m: 11.40...11.50
2nd speed rpm : 1100
Rack travel in m: 10.20...10.30
3rd speed rpm : 900
Rack travel in m: 11.00...11.20
4th speed rpm : 1000
Rack travel in m: 10.30...10.60

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 11.40...11.50

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.20...9.30
2nd pressure hPa : 310
Rack travel in m: 10.30...10.40
3rd pressure hPa : 430
Rack travel in m: 10.90...11.10

START CUT-OUT

Speed 1/min : 170 (190)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 1100
Del.quantity cm³/ : 160.0...166.0
1000 s: (157.0...169.0)
Aneroid pressure h: 700
Speed rpm : 650
Del.quantity cm³/ : 171.0...177.0
1000 s: (168.0...180.0)
Aneroid pressure h: 310
Speed rpm : 500
Del.quantity cm³/ : 131.0...137.0
1000 s: (128.0...140.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 104.0...106.0
1000 s: (101.0...109.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.20
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 205.0...225.0
1000 s: (201.0...229.0)

LOW IDLE

Speed rpm : 250
Rack travel in mm : 6.20...6.40
Del.quantity cm³/ : 12.0...18.0
1000 s: (9.0...21.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: MAN-NR. 2-7111

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,1q32
 Edition : 02.01.90
 Replaces : 11.1.88
 Test oil : ISO-4113
 Combination no. : 0 402 046 209
 Injection pump
 Pump designation : PES6P120A720LS388
 EP type number : 0 412 026 030
 Governor
 Governor design. : RQ250/1100PA509
 Governor no. : 0 421 801 117

Customer-spec. information
 Customer : MAN

Engine : D2566MK

1st version kW : 206.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10
 : (2.95...3.15)
 Rack travel in mm : 9.00...12.00
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 11.40...11.50

Del.quantity cm3/ : 17.8...18.0

100 s: (17.5...18.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 6.2...6.4

Del.quantity cm3/ : 1.2...1.8

100 s: (0.9...2.1)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Aneroid pressure h: 700

Del.quantity : 178.0...180.0

1000 : (175.0...183.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.20

Speed rpm : 1145...1160
2nd rack travel in: 4.00
Speed rpm : 1180...1210
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 6.3

Testing:

Speed rpm : 100
Minimum rack trave: 7.80
Speed rpm : 250
Rack travel in mm : 6.20...6.40
Rack travel in mm : 2.00
Speed rpm : 335...375

TORQUE CONTROL

Dimension a mm : 0.50
Torque control curve - 1st version
1st speed rpm : 750
Rack travel in m: 11.40...11.50
2nd speed rpm : 1100
Rack travel in m: 10.20...10.30
3rd speed rpm : 875
Rack travel in m: 11.10...11.30
4th speed rpm : 985
Rack travel in m: 10.40...10.70

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 11.40...11.50

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.20...9.30
2nd pressure hPa : 310
Rack travel in m: 10.30...10.40
3rd pressure hPa : 430
Rack travel in m: 10.90...11.10

START CUT-OUT

Speed 1/min : 170 (190)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 1100
Del.quantity cm3/ : 160.0...166.0
1000 s: (157.0...169.0)
Aneroid pressure h: 700
Speed rpm : 650
Del.quantity cm3/ : 171.0...177.0
1000 s: (168.0...180.0)
Aneroid pressure h: 310
Speed rpm : 500
Del.quantity cm3/ : 131.0...137.0
1000 s: (128.0...140.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 104.0...106.0
1000 s: (101.0...109.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.20
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 205.0...225.0
1000 s: (201.0...229.0)

LOW IDLE

Speed rpm : 250
Rack travel in mm : 6.20...6.40
Del.quantity cm3/ : 12.0...18.0
1000 s: (9.0...21.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

: MAN-NR. 2-7066

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a
Edition : 04.09.90
Replaces : 02.05.90
Test oil : ISO-4113

Combination no. : 0 402 746 810

Injection pump
Pump designation : PES6P120A72ORS7135
EP type number : 0 412 726 807
Governor
Governor design. : RQV325...900PA848K
Governor no. : 0 421 815 168

Customer-spec. information
Customer : MACK TRUCKS

Engine : E6 350 4VH

1st version kW : 261.0
Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 160...170

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
(2.70...2.90)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.90...14.00

Del.quantity cm³/ : 23.6...23.8

100 s: (23.3...24.1)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0
Rack travel in mm : 4.0...4.2
Del.quantity cm³/ : 3.2...3.8
100 s: (3.0...4.0)
Spread cm³ : 0.8
100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
travel mm : 1.20...1.40
2nd speed rpm : 450
travel mm : 3.10...3.30
3rd speed rpm : 850
travel mm : 5.90...6.10
4th speed rpm : 1000
travel mm : 7.50...7.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 900
Aneroid pressure h: 900
Del.quantity : 236.5...238.5
1000 : (233.5...241.5)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 53...61

Testing:
1st rack travel in: 12.90
Speed rpm : 950...960
2nd rack travel in: 4.00
Speed rpm : 1075...1105
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack travel: 5.60
Speed rpm : 325
Rack travel in mm : 4.00...4.20

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 13.90...14.00
2nd speed rpm : 625
Rack travel in m: 14.10...14.20
3rd speed rpm : 800
Rack travel in m: 14.00...14.10
4th speed rpm : 500
Rack travel in m: 0.00...13.50

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 625
Pressure hPa : 900
Rack travel mm : 14.10...14.20

Measurement
Speed 1/min : 625

1st pressure hPa : -
Rack travel in m: 8.50...8.90
2nd pressure hPa : 275
Rack travel in m: 10.00...10.10
3rd pressure hPa : 570
Rack travel in m: 12.30...12.70

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 625
Del.quantity cm3/ : 257.0...263.0
1000 s: (254.0...266.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 900
Speed rpm : 850
Del.quantity cm3/ : 159.0...161.0 *
1000 s: (141.5...162.5)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 142.0...146.0
1000 s: (140.0...148.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.90
Speed rpm : 950...960

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 8.50...8.90

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.00...4.20
Del.quantity cm3/ : 32.0...38.0
1000 s: (30.0...40.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:
: MACK # 313GC5173P10

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a1
 Edition : 04.09.90
 Replaces : 02.05.90
 Test oil : ISO-4113

Combination no. : 0 402 746 814

Injection pump
 Pump designation : PES6P120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...850PA848-1K
 Governor no. : 0 421 815 169

Customer-spec. information
 Customer : MACK TRUCKS

Engine : E6 300 4VH

1st version kW : 224.0
 Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 20.0...20.2
 100 s: (19.7...20.5)

Spread cm3 : 0.5
 100 s: (0.9)

2nd speed rpm : 325.0
 Rack travel in mm : 4.5...4.7
 Del.quantity cm3/ : 3.2...3.8
 100 s: (3.0...4.0)
 Spread cm3 : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40
 2nd speed rpm : 450
 travel mm : 2.80...3.10
 3rd speed rpm : 850
 travel mm : 6.20...6.40
 4th speed rpm : 1000
 travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 850
 Aneroid pressure h: 900
 Del.quantity : 200.5...202.5
 1000 : (197.5...205.5)
 Spread cm3 : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 52...60

Testing:
1st rack travel in: 11.90
Speed rpm : 900...910
2nd rack travel in: 4.00
Speed rpm : 1025...1055
4th rack travel in: 1100
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack travel: 6.10
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 12.90...13.00
2nd speed rpm : 700
Rack travel in m: 13.30...13.50
3rd speed rpm : 600
Rack travel in m: 13.50...13.70
4th speed rpm : 500
Rack travel in m: 0.00...13.10

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 13.50...13.70

Measurement
Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 9.90...10.30
2nd pressure hPa : 250
Rack travel in m: 10.90...11.00
3rd pressure hPa : 475
Rack travel in m: 12.60...13.00

FUEL DELIVERY CHARACTERISTICS

L21

1st version
Aneroid pressure h: 900
Speed rpm : 700
Del.quantity cm3/ : 217.0...223.0
1000 s: (214.0...226.0)
Aneroid pressure h: 900
Speed rpm : 600
Del.quantity cm3/ : 233.0...239.0
1000 s: (230.0...242.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 900
Speed rpm : 850
Del.quantity cm3/ : 159.0...161.0 *
1000 s: (141.5...162.5)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 154.0...158.0
1000 s: (152.0...160.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.90
Speed rpm : 900...910

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 195.0...235.0
1000 s: (185.0...245.0)
Rack travel in mm : 9.90...10.30

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm3/ : 32.0...38.0
1000 s: (30.0...40.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5173P6

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of

start-of-delivery sensor on cyl. 1
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a2
 Edition : 04.09.90
 Replaces : 02.05.90
 Test oil : ISO-4113
 Combination no. : 0 402 746 815
 Injection pump
 Pump designation : PES6P120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...850PA848-2K
 Governor no. : 0 421 815 170

Customer-spec. information
 Customer : MACK TRUCKS

Engine : E6 275 4VH

1st version kW : 202.0
 Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.00...12.10

Del.quantity cm3/ : 18.1...18.3

100 s: (17.8...18.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 181.0...183.0

1000 : (178.0...186.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 52...60

Testing:

1st rack travel in: 11.00
Speed rpm : 900...910
2nd rack travel in: 4.00
Speed rpm : 1025...1055
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 7...15

Testing:

Speed rpm : 275
Minimum rack travel: 6.10
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 12.00...12.10
2nd speed rpm : 600
Rack travel in m: 12.60...12.70
3rd speed rpm : 700
Rack travel in m: 12.50...12.70
4th speed rpm : 500
Rack travel in m: 0.00...12.40

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 12.60...12.70

Measurement

Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 9.50...9.90
2nd pressure hPa : 215
Rack travel in m: 10.30...10.40
3rd pressure hPa : 360
Rack travel in m: 11.50...11.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 600
Del.quantity cm3/ : 210.5...216.5
1000 s: (207.5...219.5)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 900
Speed rpm : 850
Del.quantity cm3/ : 159.0...161.0 *
1000 s: (141.5...162.5)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 144.0...148.0
1000 s: (142.0...150.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.00
Speed rpm : 900...910

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 160.0...200.0
1000 s: (150.0...210.0)
Rack travel in mm : 9.50...9.90

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm3/ : 32.0...38.0
1000 s: (30.0...40.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5173P2

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a3
 Edition : 04.09.90
 Replaces : 02.05.90
 Test oil : ISO-4113
 Combination no. : 0 402 746 816
 Injection pump
 Pump designation : PES6P120A72ORS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...875PA848-3K
 Governor no. : 0 421 815 171

Customer-spec. information
 Customer : MACK TRUCKS

Engine : EM6-250L 4VH

1st version kw : 186.0
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 16.3...16.5

100 s: (16.0...16.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 163.0...165.0

1000 : (160.0...168.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 52...60

Testing:
1st rack travel in: 9.80
Speed rpm : 925...935
2nd rack travel in: 4.00
Speed rpm : 1010...1040
4th rack travel in: 1100
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 9...17

Testing:
Speed rpm : 275
Minimum rack travel: 6.10
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 10.80...10.90
2nd speed rpm : 510
Rack travel in m: 13.00...13.20
3rd speed rpm : 700
Rack travel in m: 11.60...11.80
4th speed rpm : 550
Rack travel in m: 0.00...13.10

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 13.00...13.20

Measurement
Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 9.10...9.50
2nd pressure hPa : 215
Rack travel in m: 10.30...10.40
3rd pressure hPa : 435
Rack travel in m: 12.20...12.60

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm3/ : 240.0...246.0
1000 s: (237.0...249.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 900
Speed rpm : 850
Del.quantity cm3/ : 159.0...161.0 *
1000 s: (141.5...162.5)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 146.0...150.0
1000 s: (144.0...152.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.80
Speed rpm : 925...935

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 165.0...205.0
1000 s: (155.0...215.0)
Rack travel in mm : 9.10...9.50

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm3/ : 39.0...45.0
1000 s: (37.0...47.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:
: MACK # 313GC5173P18

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a4
 Edition : 04.09.90
 Replaces : 02.05.90
 Test oil : ISO-4113

Combination no. : 0 402 746 817

Injection pump
 Pump designation : PES6P120A72ORS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...900PA848-4K
 Governor no. : 0 421 815 173

Customer spec. information
 Customer : MACK TRUCKS INC.

Engine : EC6 350 4VH

1st version kW : 261.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 15.20...15.30

Del.quantity cm³/ : 25.0...25.2
 100 s: (24.7...25.5)

Spread cm³ : 0.5
 100 s: (0.9)

2nd speed rpm : 325.0
 Rack travel in mm : 4.9...5.1
 Del.quantity cm³/ : 3.9...4.5
 100 s: (3.7...4.7)

Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40
 2nd speed rpm : 450
 travel mm : 3.10...3.30
 3rd speed rpm : 850
 travel mm : 5.90...6.10
 4th speed rpm : 1000
 travel mm : 7.50...7.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 900
 Aneroid pressure h: 1200
 Del.quantity : 250.5...252.5
 1000 : (247.5...255.5)

Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 56...64

Testing:

1st rack travel in: 14.20

Speed rpm : 950...960

2nd rack travel in: 4.00

Speed rpm : 1090...1120

4th rack travel in: 1200

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 7...15

Testing:

Speed rpm : 275

Minimum rack travel: 6.50

Speed rpm : 325

Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 900

Rack travel in m: 15.20...15.30

2nd speed rpm : 625

Rack travel in m: 15.50...15.60

3rd speed rpm : 700

Rack travel in m: 15.40...15.60

4th speed rpm : 500

Rack travel in m: 0.00...15.00

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 625

Pressure hPa : 1200

Rack travel mm : 15.50...15.60

Measurement

Speed 1/min : 625

1st pressure hPa : -

Rack travel in m: 8.60...9.00

2nd pressure hPa : 280

Rack travel in m: 10.70...10.80

3rd pressure hPa : 650

Rack travel in m: 13.60...14.00

FUEL DELIVERY CHARACTERISTICS

L28

1st version

Aneroid pressure h: 1200

Speed rpm : 625

Del.quantity cm3/ : 278.0...284.0

1000 s: (275.0...287.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 1200

Speed rpm : 850

Del.quantity cm3/ : 159.0...161.0 *

1000 s: (141.5...162.5)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 130.5...134.5

1000 s: (128.5...136.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.20

Speed rpm : 950...960

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 120.0...160.0

1000 s: (110.0...170.0)

Rack travel in mm : 8.60...9.00

LOW IDLE

Speed rpm : 325

Rack travel in mm : 4.90...5.10

Del.quantity cm3/ : 39.0...45.0

1000 s: (37.0...47.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P14

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a5
 Edition : 04.09.90
 Replaces : 02.05.90
 Test oil : ISO-4113

Combination no. : 0 402 746 818

Injection pump
 Pump designation : PES6P120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...875PA848-5K
 Governor no. : 0 421 815 174

Customer-spec. information
 Customer : MACK TRUCKS INC.

Engine : EM 6 275L 4VH

1st version kW : 202.0
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 19.0...19.2

100 s: (18.7...19.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.6...4.8

Del.quantity cm3/ : 3.7...4.3

100 s: (3.5...4.5)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 190.0...192.0

1000 : (187.0...195.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 52...60

Testing:

1st rack travel in: 11.20

Speed rpm : 925...935

2nd rack travel in: 4.00

Speed rpm : 1030...1060

4th rack travel in: 1150

Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever

position degrees: 9...17

Testing:

Speed rpm : 275

Minimum rack travel: 1.50

Speed rpm : 325

Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 875

Rack travel in m: 12.20...12.30

2nd speed rpm : 510

Rack travel in m: 14.10...14.30

3rd speed rpm : 700

Rack travel in m: 13.20...13.40

4th speed rpm : 400

Rack travel in m: 0.00...13.80

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 510

Pressure hPa : 1200

Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 510

1st pressure hPa : -

Rack travel in m: 9.40...9.60

2nd pressure hPa : 280

Rack travel in m: 10.60...10.70

3rd pressure hPa : 485

Rack travel in m: 12.70...13.30

FUEL DELIVERY CHARACTERISTICS

M02

1st version

Aneroid pressure h: 1200

Speed rpm : 510

Del.quantity cm3/ : 262.5...268.5

1000 s: (259.5...271.5)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 1200

Speed rpm : 850

Del.quantity cm3/ : 159.0...161.0 *

1000 s: (141.5...162.5)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 145.0...149.0

1000 s: (143.0...151.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.20

Speed rpm : 925...935

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 170.0...210.0

1000 s: (160.0...220.0)

Rack travel in mm : 9.40...9.60

LOW IDLE

Speed rpm : 325

Rack travel in mm : 4.60...4.80

Del.quantity cm3/ : 37.0...43.0

1000 s: (35.0...45.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P22

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a6
 Edition : 04.09.90
 Replaces : 02.05.90
 Test oil : ISO-4113

Combination no. : 0 402 746 819

Injection pump
 Pump designation : PES6P120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...875PA848-6K
 Governor no. : 0 421 815 175

Customer-spec. information
 Customer : MACK TRUCKS

Engine : EM6-225L 4VH

1st version kW : 165.0
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.00...11.10

Del.quantity cm³/ : 15.8...16.0

100 s: (15.5...16.3)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.6...4.8

Del.quantity cm³/ : 3.8...4.4

100 s: (3.6...4.6)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40

2nd speed rpm : 450
 travel mm : 2.80...3.20

3rd speed rpm : 850
 travel mm : 6.20...6.40

4th speed rpm : 1000
 travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 158.5...160.5

1000 : (155.5...163.5)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 52...60

Testing:
1st rack travel in: 10.00
Speed rpm : 925...935
2nd rack travel in: 4.00
Speed rpm : 1015...1045
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 9...17

Testing:
Speed rpm : 275
Minimum rack travel: 6.20
Speed rpm : 325
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 11.00...11.10
2nd speed rpm : 510
Rack travel in m: 13.20...13.40
3rd speed rpm : 700
Rack travel in m: 11.80...12.00
4th speed rpm : 600
Rack travel in m: 12.50...12.70
5th speed rpm : 350
Rack travel in m: 0.00...13.20

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 13.20...13.40

Measurement
Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.50...8.90
2nd pressure hPa : 220
Rack travel in m: 9.70...9.80
3rd pressure hPa : 500
Rack travel in m: 12.00...12.40

MO4

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm3/ : 234.0...240.0
1000 s: (231.0...243.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 1200
Speed rpm : 850
Del.quantity cm3/ : 159.0...161.0 *
1000 s: (141.5...162.5)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 131.0...135.0
1000 s: (129.0...137.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.00
Speed rpm : 925...935

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 135.0...175.0
1000 s: (125.0...185.0)
Rack travel in mm : 8.50...8.90

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.60...4.80
Del.quantity cm3/ : 38.0...44.0
1000 s: (36.0...46.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks: : MACK # 313GC5173P26

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b5
Edition : 04.09.90
Replaces : 2.5.90
Test oil : ISO-4113

Combination no. : 0 402 746 820

Injection pump
Pump designation : PES6P120A720RS7135
EP type number : 0 412 726 807
Governor
Governor design. : RQV325...850PA878K
Governor no. : 0 421 815 177

Customer-spec. information
Customer : MACK TRUCKS INC.

Engine : E6 275 4VH

1st version kW : 202.0
Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 160...170

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850
Rack travel in mm : 12.00...12.10
Del.quantity cm3/ : 18.1...18.3
 100 s: (17.8...18.6)
Spread cm3 : 0.5
 100 s: (0.9)

2nd speed rpm : 325.0
Rack travel in mm : 4.5...4.7
Del.quantity cm3/ : 3.2...3.8
 100 s: (3.0...4.0)
Spread cm3 : 0.8
 100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
travel mm : 1.20...1.40
2nd speed rpm : 450
travel mm : 2.80...3.10
3rd speed rpm : 850
travel mm : 6.20...6.40
4th speed rpm : 1000
travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 850
Aneroid pressure h: 900
Del.quantity : 181.0...183.0
 1000 : (178.0...186.0)
Spread cm3 : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control Lever
position degrees: 52...60

Testing:
1st rack travel in: 11.00
Speed rpm : 900...910
2nd rack travel in: 4.00
Speed rpm : 1025...1055
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control Lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack travel: 6.10
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 12.00...12.10
2nd speed rpm : 600
Rack travel in m: 12.60...12.70
3rd speed rpm : 700
Rack travel in m: 12.50...12.70
4th speed rpm : 500
Rack travel in m: 0.00...12.40

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 12.60...12.70

Measurement
Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 9.50...9.90
2nd pressure hPa : 215
Rack travel in m: 10.30...10.40
3rd pressure hPa : 360
Rack travel in m: 11.50...11.90

FUEL DELIVERY CHARACTERISTICS

M07

1st version
Aneroid pressure h: 900
Speed rpm : 600
Del.quantity cm3/ : 210.5...216.5
1000 s: (207.5...219.5)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 900
Speed rpm : 850
Del.quantity cm3/ : 159.0...161.0 *
1000 s: (141.5...162.5)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 144.0...148.0
1000 s: (142.0...150.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.00
Speed rpm : 900...910

INTERMEDIATE RATED SPEED
Rack travel in mm : 11.30
Speed rpm : 805
Rack travel in mm : 4.60
Speed rpm : 300

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 160.0...200.0
1000 s: (150.0...210.0)
Rack travel in mm : 9.50...9.90

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm3/ : 32.0...38.0
1000 s: (30.0...40.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:
: MACK # 313GC5173-P4

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of
~~start-of-delivery~~ sensor on cyl. 1
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b
 Edition : 04.05.90
 Replaces : 2.5.90
 Test oil : ISO-4113

Combination no. : 0 402 746 821

Injection pump
 Pump designation : PES6P120A72ORS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...850PA878-1K
 Governor no. : 0 421 815 178

Customer-spec. information
 Customer : MACK TRUCKS INC.

Engine : E6 300 4VH

1st version kW : 224.0
 Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm³/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm³/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40

2nd speed rpm : 450
 travel mm : 2.80...3.10

3rd speed rpm : 850
 travel mm : 6.20...6.40

4th speed rpm : 1000
 travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 200.5...202.5

1000 : (197.5...205.5)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 52...60

Testing:

1st rack travel in: 11.90

Speed rpm : 900...910

2nd rack travel in: 4.00

Speed rpm : 1025...1055

4th rack travel in: 1100

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 7...15

Testing:

Speed rpm : 275

Minimum rack travel: 6.10

Speed rpm : 325

Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 850

Rack travel in m: 12.90...13.00

2nd speed rpm : 700

Rack travel in m: 13.30...13.50

3rd speed rpm : 600

Rack travel in m: 13.50...13.70

4th speed rpm : 500

Rack travel in m: 0.00...13.10

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 600

Pressure hPa : 900

Rack travel mm : 13.50...13.70

Measurement

Speed 1/min : 600

1st pressure hPa : -

Rack travel in m: 9.90...10.30

2nd pressure hPa : 250

Rack travel in m: 10.90...11.00

3rd pressure hPa : 475

Rack travel in m: 12.60...13.00

FUEL DELIVERY CHARACTERISTICS

M10

1st version

Aneroid pressure h: 900

Speed rpm : 700

Del.quantity cm3/ : 217.0...223.0

1000 s: (214.0...226.0)

Aneroid pressure h: 900

Speed rpm : 600

Del.quantity cm3/ : 233.0...239.0

1000 s: (230.0...242.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 900

Speed rpm : 850

Del.quantity cm3/ : 159.0...161.0 *

1000 s: (141.5...162.5)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 154.0...158.0

1000 s: (152.0...160.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.90

Speed rpm : 900...910

INTERMEDIATE RATED SPEED

Rack travel in mm : 12.00

Speed rpm : 805

Rack travel in mm : 4.60

Speed rpm : 300.0

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 195.0...235.0

1000 s: (185.0...245.0)

Rack travel in mm : 9.90...10.30

LOW IDLE

Speed rpm : 325

Rack travel in mm : 4.50...4.70

Del.quantity cm3/ : 32.0...38.0

1000 s: (30.0...40.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P8

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test

bench: setting for test equipment,
check value for engine equipment.
Delivery-valve spring pre-tension
3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b1
Edition : 04.09.90
Replaces : 02.05.90
Test oil : ISO-4113

Combination no. : 0 402 746 822

Injection pump
Pump designation : PES6P120A72ORS7135
EP type number : 0 412 726 807
Governor
Governor design. : RGV325...900PA878-2K
Governor no. : 0 421 815 179

Customer-spec. information
Customer : MACK TRUCKS INC.

Engine : E6 350 4VH

1st version kW : 261.0
Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 160...170

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
(2.70...2.90)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 23.6...23.8

100 s: (23.3...24.1)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.0...4.2

Del.quantity cm3/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 3.10...3.30

3rd speed rpm : 850

travel mm : 5.90...6.10

4th speed rpm : 1000

travel mm : 7.50...7.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 900

Del.quantity : 236.5...238.5

1000 : (233.5...241.5)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 55...63

Testing:

1st rack travel in: 12.90

Speed rpm : 950...960

2nd rack travel in: 4.00

Speed rpm : 1075...1105

4th rack travel in: 1150

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 7...15

Testing:

Speed rpm : 275

Minimum rack travel: 5.60

Speed rpm : 325

Rack travel in mm : 4.00...4.20

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 900

Rack travel in m: 13.90...14.00

2nd speed rpm : 625

Rack travel in m: 14.10...14.20

3rd speed rpm : 800

Rack travel in m: 14.00...14.10

4th speed rpm : 500

Rack travel in m: 0.00...13.50

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 625

Pressure hPa : 900

Rack travel mm : 14.10...14.20

Measurement

Speed 1/min : 625

1st pressure hPa : -

Rack travel in m: 8.30...8.70

2nd pressure hPa : 275

Rack travel in m: 10.00...10.10

3rd pressure hPa : 570

Rack travel in m: 12.30...12.70

FUEL DELIVERY CHARACTERISTICS

M13

1st version

Aneroid pressure h: 900

Speed rpm : 625

Del.quantity cm3/ : 257.0...263.0

1000 s: (254.0...266.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 900

Speed rpm : 850

Del.quantity cm3/ : 159.0...161.0 *

1000 s: (141.5...162.5)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 136.0...140.0

1000 s: (134.0...142.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.90

Speed rpm : 950...960

INTERMEDIATE RATED SPEED

Rack travel in mm : 13.00

Speed rpm : 805

Rack travel in mm : 4.10

Speed rpm : 300

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 140.0...180.0

1000 s: (130.0...190.0)

Rack travel in mm : 8.30...8.70

LOW IDLE

Speed rpm : 325

Rack travel in mm : 4.00...4.20

Del.quantity cm3/ : 32.0...38.0

1000 s: (30.0...40.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P12

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b2
 Edition : 04.09.90
 Replaces : 02.05.90
 Test oil : ISO-4113

Combination no. : 0 402 746 823

Injection pump
 Pump designation : PES6P120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...875PA878-3K
 Governor no. : 0 421 815 180

Customer-spec. information
 Customer : MACK TRUCKS INC.

Engine : EM6 275L 4VH

1st version kW : 202.0
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 19.0...19.2

100 s: (18.7...19.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.6...4.8

Del.quantity cm3/ : 3.7...4.3

100 s: (3.5...4.5)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40

2nd speed rpm : 450
 travel mm : 2.80...3.10

3rd speed rpm : 850
 travel mm : 6.20...6.40

4th speed rpm : 1000
 travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 190.0...192.0

1000 : (187.0...195.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 52...60

Testing:
1st rack travel in: 11.20
Speed rpm : 925...935
2nd rack travel in: 4.00
Speed rpm : 1030...1060
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 9...17

Testing:
Speed rpm : 275
Minimum rack travel: 6.20
Speed rpm : 325
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 12.20...12.30
2nd speed rpm : 510
Rack travel in m: 14.10...14.30
3rd speed rpm : 700
Rack travel in m: 13.20...13.40
4th speed rpm : 400
Rack travel in m: 0.00...13.80

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 14.10...14.30

Measurement
Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 9.40...9.60
2nd pressure hPa : 280
Rack travel in m: 10.60...10.70
3rd pressure hPa : 485
Rack travel in m: 12.70...13.30

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm3/ : 262.5...268.5
1000 s: (259.5...271.5)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 1200
Speed rpm : 850
Del.quantity cm3/ : 159.0...161.0 *
1000 s: (141.5...162.5)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 145.0...149.0
1000 s: (143.0...151.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.20
Speed rpm : 925...935

INTERMEDIATE RATED SPEED
Rack travel in mm : 10.30
Speed rpm : 805.0
Rack travel in mm : 4.70
Speed rpm : 300

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 9.40...9.60

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.60...4.80
Del.quantity cm3/ : 37.0...43.0
1000 s: (35.0...45.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P24

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b3
Edition : 04.09.90
Replaces : 02.05.90
Test oil : ISO-4113

Combination no. : 0 402 746 824

Injection pump
Pump designation : PES6P120A72ORS7135
EP type number : 0 412 726 807
Governor
Governor design. : RQV325...875PA878-4K
Governor no. : 0 421 815 181

Customer-spec. information
Customer : MACK TRUCKS INC.

Engine : EM6 225L 4VH

1st version kW : 165.0
Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 160...170

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
: (2.70...2.90)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.00...11.10

Del.quantity cm3/ : 15.8...16.0

100 s: (15.5...16.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0
Rack travel in mm : 4.6...4.8
Del.quantity cm3/ : 3.8...4.4
100 s: (3.6...4.6)

Spread cm3 : 0.8
100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
travel mm : 1.20...1.40

2nd speed rpm : 450
travel mm : 2.80...3.10

3rd speed rpm : 850
travel mm : 6.20...6.40

4th speed rpm : 1000
travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 875
Aneroid pressure h: 900
Del.quantity : 158.5...160.5
1000 : (155.5...163.5)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 52...60

Testing:
1st rack travel in: 10.00
Speed rpm : 925...935
2nd rack travel in: 4.00
Speed rpm : 1015...1045
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 9...17

Testing:
Speed rpm : 275
Minimum rack travel: 1.50
Speed rpm : 325
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 11.00...11.10
2nd speed rpm : 510
Rack travel in m: 13.20...13.40
3rd speed rpm : 600
Rack travel in m: 12.50...12.70
4th speed rpm : 700
Rack travel in m: 11.80...12.00
5th speed rpm : 350
Rack travel in m: 0.00...13.20

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 510
Pressure hPa : 900
Rack travel mm : 13.20...13.40

Measurement
Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.50...8.90
2nd pressure hPa : 220
Rack travel in m: 9.70...9.80
3rd pressure hPa : 500
Rack travel in m: 12.00...12.40

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 510
Del.quantity cm³/ : 234.0...240.0
1000 s: (231.0...243.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 900
Speed rpm : 850
Del.quantity cm³/ : 159.0...161.0 *
1000 s: (141.5...162.5)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 131.0...135.0
1000 s: (129.0...137.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.00
Speed rpm : 925...935

INTERMEDIATE RATED SPEED
Rack travel in mm : 10.20
Speed rpm : 805
Rack travel in mm : 4.60
Speed rpm : 300

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...175.0
1000 s: (125.0...185.0)
Rack travel in mm : 8.50...8.90

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.60...4.80
Del.quantity cm³/ : 38.0...44.0
1000 s: (36.0...46.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:
: MACK # 313GC5173-P28

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench; setting for test equipment, check value for engine equipment.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b6
 Edition : 04.09.90
 Replaces : 02.05.90
 Test oil : ISO-4113

Combination no. : 0 402 746 825

Injection pump
 Pump designation : PES6P120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...900PA878-5K
 Governor no. : 0 421 815 182

Customer-spec. information
 Customer : MACK TRUCKS INC.

Engine : E C 6 350 4VH

1st version kW : 261.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 15.00...15.10

Del.quantity cm³/ : 25.0...25.2
 100 s: (24.7...25.5)

Spread cm³ : 0.5
 100 s: (0.9)

2nd speed rpm : 325.0
 Rack travel in mm : 4.9...5.1
 Del.quantity cm³/ : 3.9...4.5
 100 s: (3.7...4.7)

Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40
 2nd speed rpm : 450
 travel mm : 3.10...3.30
 3rd speed rpm : 850
 travel mm : 5.90...6.10
 4th speed rpm : 1000
 travel mm : 7.50...7.70

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1130
 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 900

Aneroid pressure h: 1200
Del.quantity : 250.5...252.5
1000 : (247.5...255.5)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 56...64

Testing:
1st rack travel in: 14.00
Speed rpm : 950...960
2nd rack travel in: 4.00
Speed rpm : 1080...1110
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack travel: 6.60
Speed rpm : 325
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 15.00...15.10
2nd speed rpm : 625
Rack travel in m: 15.40...15.50
3rd speed rpm : 700
Rack travel in m: 15.30...15.40
4th speed rpm : 500
Rack travel in m: 0.00...15.00

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 625
Pressure hPa : 1200
Rack travel mm : 15.40...15.50

Measurement
Speed 1/min : 625

1st pressure hPa : -
Rack travel in m: 8.30...8.70

2nd pressure hPa : 280
Rack travel in m: 10.40...10.50
3rd pressure hPa : 650
Rack travel in m: 13.30...13.70

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 625
Del.quantity cm³/ : 272.5...278.5
1000 s: (269.5...281.5)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 1200
Speed rpm : 850
Del.quantity cm³/ : 159.0...161.0 *
1000 s: (141.5...162.5)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 130.5...134.5
1000 s: (128.5...136.5)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 14.00
Speed rpm : 950...960

INTERMEDIATE RATED SPEED
Rack travel in mm : 13.70
Speed rpm : 850
Rack travel in mm : 5.00
Speed rpm : 350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 130.0...170.0
1000 s: (120.0...180.0)
Rack travel in mm : 8.30...8.70

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.90...5.10
Del.quantity cm³/ : 39.0...45.0
1000 s: (37.0...47.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P16

Delivery-valve spring pre-tension

3.0...3.2 mm.

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b4
 Edition : 04.09.90
 Replaces : 02.05.90
 Test oil : ISO-4113
 Combination no. : 0 402 746 826
 Injection pump
 Pump designation : PES6P120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...875PA878-6K
 Governor no. : 0 421 815 183

Customer-spec. information
 Customer : MACK TRUCKS INC.

Engine : EM6 250L 4VH

1st version kw : 186.0
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 10.80...10.90

Del.quantity cm³/ : 16.3...16.5
 100 s: (16.0...16.8)

Spread cm³ : 0.5
 100 s: (0.9)

2nd speed rpm : 325.0
 Rack travel in mm : 4.5...4.7
 Del.quantity cm³/ : 3.9...4.5
 100 s: (3.7...4.7)
 Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40
 2nd speed rpm : 450
 travel mm : 2.80...3.20
 3rd speed rpm : 850
 travel mm : 6.20...6.40
 4th speed rpm : 1000
 travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 875
 Aneroid pressure h: 1200
 Del.quantity : 163.0...165.0
 1000 : (160.0...168.0)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 52...60

Testing:
1st rack travel in: 9.80
Speed rpm : 925...935
2nd rack travel in: 4.00
Speed rpm : 1010...1040
4th rack travel in: 1100
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 9...17

Testing:
Speed rpm : 275
Minimum rack travel: 6.10
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 10.80...10.90
2nd speed rpm : 510
Rack travel in m: 13.00...13.20
3rd speed rpm : 700
Rack travel in m: 11.60...11.80
4th speed rpm : 550
Rack travel in m: 0.00...13.10

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 13.00...13.20

Measurement
Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.60...9.00
2nd pressure hPa : 215
Rack travel in m: 10.30...10.40
3rd pressure hPa : 435
Rack travel in m: 12.20...12.60

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm³/ : 240.0...246.0
1000 s: (237.0...249.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 1200
Speed rpm : 850
Del.quantity cm³/ : 159.0...161.0 *
1000 s: (141.5...162.5)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 146.0...150.0
1000 s: (144.0...152.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.80
Speed rpm : 925...935

INTERMEDIATE RATED SPEED
Rack travel in mm : 10.20
Speed rpm : 805
Rack travel in mm : 4.60
Speed rpm : 300

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 145.0...185.0
1000 s: (135.0...195.0)
Rack travel in mm : 8.60...9.00

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm³/ : 39.0...45.0
1000 s: (37.0...47.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:
: MACK # 313GC5173-P20

Delivery-valve spring pre-tension
3.0...3.2 mm.

* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,

check value for engine equipment.
Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 d
 Edition : 04.09.90
 Replaces : 02.05.90
 Test oil : ISO-4113

Combination no. : 0 402 746 828

Injection pump
 Pump designation : PES6P120A72ORS7148
 EP type number : 0 412 726 810
 Governor
 Governor design. : RQV325...875PA878-7K
 Governor no. : 0 421 815 184

Customer-spec. information
 Customer : MACK TRUCKS INC.

Engine : EM6 300L 4VH

1st version kW : 224.0
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 6.00...8.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 19.9...20.1

100 s: (19.6...20.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40

2nd speed rpm : 450
 travel mm : 2.50...2.80

3rd speed rpm : 600
 travel mm : 4.10...4.30

4th speed rpm : 875
 travel mm : 7.30...7.50

5th speed rpm : 1000
 travel mm : 8.70...9.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1500

Del.quantity : 199.0...201.0

1000 : (196.0...204.0)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 55...63

Testing:
1st rack travel in: 10.10
Speed rpm : 915...925
2nd rack travel in: 4.00
Speed rpm : 1000...1030
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack travel: 6.10
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 11.10...11.20
2nd speed rpm : 510
Rack travel in m: 16.50...16.70
3rd speed rpm : 700
Rack travel in m: 13.30...13.50
4th speed rpm : 600
Rack travel in m: 15.50...15.70
5th speed rpm : 450
Rack travel in m: 0.00...16.60

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 510
Pressure hPa : 1500
Rack travel mm : 16.50...16.70

Measurement
Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.30...8.70
2nd pressure hPa : 370

M28

Rack travel in m: 10.70...10.80
3rd pressure hPa : 710
Rack travel in m: 14.40...14.80

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1500
Speed rpm : 510
Del.quantity cm³/ : 299.0...305.0
1000 s: (296.0...308.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 1500
Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0
1000 s: (168.0...193.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 152.5...156.5
1000 s: (150.5...158.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.10
Speed rpm : 915...925

INTERMEDIATE RATED SPEED
Rack travel in mm : 11.30
Speed rpm : 805
Rack travel in mm : 4.60
Speed rpm : 300

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...160.0
1000 s: (135.0...165.0)
Rack travel in mm : 8.30...8.70

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm³/ : 39.0...45.0
1000 s: (37.0...47.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:
: MACK # 313GC5174-P4
Delivery-valve spring pre-tension
3.0...3.2 mm.

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a7
Edition : 04.09.90
Replaces : 02.05.90
Test oil : ISO-4113

Combination no. : 0 402 746 829

Injection pump
Pump designation : PES6P120A720RS7135
EP type number : 0 412 726 807
Governor
Governor design. : RQV325...1050PA848-8
K
Governor no. : 0 421 815 185

Customer-spec. information
Customer : MACK TRUCKS

Engine : E6-270 4VH

1st version kW : 201.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 160...170

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
(2.70...2.90)
Rack travel in mm : 10.50
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)
Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050
Rack travel in mm : 12.20...12.30
Del.quantity cm3/ : 17.4...17.6
100 s: (17.1...17.9)
Spread cm3 : 0.5
100 s: (0.9)

2nd speed rpm : 325.0
Rack travel in mm : 4.9...5.1
Del.quantity cm3/ : 3.8...4.4
100 s: (3.6...4.6)
Spread cm3 : 0.8
100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL
1st speed rpm : 325
travel mm : 1.40...1.60
2nd speed rpm : 450
travel mm : 2.50...2.80
3rd speed rpm : 800
travel mm : 4.80...5.00
4th speed rpm : 1050
travel mm : 7.30...7.60
5th speed rpm : 1200
travel mm : 9.40...9.60

GUIDE SLEEVE POSITION
Control-lever position
Degree: -1
Speed rpm : 1210
Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1050
Aneroid pressure h: 900
Del.quantity : 174.0...176.0
1000 : (171.0...179.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 55...63

Testing:
1st rack travel in: 11.20
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 10...18

Testing:
Speed rpm : 275
Minimum rack travel: 6.40
Speed rpm : 325
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION
Speed rpm : 325...600

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 12.20...12.30
2nd speed rpm : 630
Rack travel in m: 12.00...12.20
3rd speed rpm : 925
Rack travel in m: 11.90...12.10
4th speed rpm : 800
Rack travel in m: 12.20...12.40

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 630
Pressure hPa : 900
Rack travel mm : 12.00...12.10

Measurement
Speed 1/min : 630

N03

1st pressure hPa : -
Rack travel in m: 8.60...9.00
2nd pressure hPa : 270
Rack travel in m: 9.60...9.70
3rd pressure hPa : 400
Rack travel in m: 11.00...11.50

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 630
Del.quantity cm3/ : 192.0...198.0
1000 s: (189.0...201.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 900
Speed rpm : 850
Del.quantity cm3/ : 159.0...161.0
1000 s: (140.5...161.5)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 129.0...133.0
1000 s: (127.0...135.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.20
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 135.0...175.0
1000 s: (125.0...185.0)
Rack travel in mm : 8.60...9.00

LOW IDLE

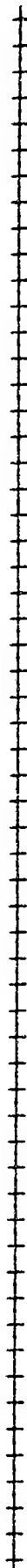
Speed rpm : 325
Rack travel in mm : 4.90...5.10
Del.quantity cm3/ : 38.0...44.0
1000 s: (36.0...46.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks: : MACK # 313GC5173P30

Delivery-valve spring pre-tension
3.0...3.2 mm.

* This test specification applies only

to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.
Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a
Edition : 04.09.90
Replaces : 02.05.90
Test oil : ISO-4113

Combination no. : 0 402 746 836

Injection pump
Pump designation : PES6P120A72ORS7157
EP type number : 0 412 726 814
Governor
Governor design. : RQV325...900PA848-12
K

Governer no. : 0 421 815 192

Customer-spec. information
Customer : MACK TRUCKS INC.

Engine : E7 400 4VH

1st version kw : 298.0
Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow
quantity min. 1/h: 160...170

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

N05

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
: (2.70...2.90)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Phasing :
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900
Rack travel in mm : 15.50...15.60
Del.quantity cm3/ : 27.2...27.4
100 s: (26.9...27.7)
Spread cm3 : 0.5
100 s: (0.9)

2nd speed rpm : 325.0
Rack travel in mm : 4.9...5.1
Del.quantity cm3/ : 4.3...4.9
100 s: (4.1...5.1)
Spread cm3 : 0.8
100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
travel mm : 1.30...1.60
2nd speed rpm : 500
travel mm : 3.40...4.00
3rd speed rpm : 900
travel mm : 6.70...6.90
4th speed rpm : 1075
travel mm : 8.40...8.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 900
Aneroid pressure h: 1200
Del.quantity : 272.0...274.0
1000 : (269.0...277.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 56...64

Testing:
1st rack travel in: 14.50
Speed rpm : 940...950
2nd rack travel in: 4.00
Speed rpm : 1115...1145
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 10...18

Testing:
Speed rpm : 275
Minimum rack travel: 1.50
Speed rpm : 325
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION
Speed rpm : 325...500

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 15.50...15.60
2nd speed rpm : 625
Rack travel in m: 15.30...15.50
3rd speed rpm : 500
Rack travel in m: 0.00...14.60

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 900
Pressure hPa : 1200
Rack travel mm : 15.50...15.60

Measurement
Speed 1/min : 900

1st pressure hPa : -
Rack travel in m: 8.20...8.60
2nd pressure hPa : 225
Rack travel in m: 9.40...9.50
3rd pressure hPa : 770
Rack travel in m: 13.80...14.20

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 625
Del.quantity cm3/ : 309.0...315.0
1000 s: (306.0...318.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 1200
Speed rpm : 850
Del.quantity cm3/ : 159.0...161.0
1000 s: (136.5...157.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 166.0...170.0
1000 s: (164.0...172.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 14.50
Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 9.90...10.30

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.90...5.10
Del.quantity cm3/ : 43.0...49.0
1000 s: (41.0...51.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks: : MACK # 313GC5179-P18

Delivery-valve spring pre-tension
3.0...3.2 mm.

* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.
Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a1
 Edition : 04.09.90
 Replaces : 02.05.90
 Test oil : ISO-4113

Combination no. : 0 402 746 837

Injection pump
 Pump designation : PES6P12DA72ORS7157
 EP type number : 0 412 726 814
 Governor
 Governor design. : RQV325...900PA848-15
 K
 Governor no. : 0 421 815 193

Customer-spec. information
 Customer : MACK TRUCKS INC.

Engine : E7 350 4VH

1st version kW : 261.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

NO7

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Phasing :
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.00...14.10

Del.quantity cm3/ : 22.8...23.0

100 s: (22.5...23.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0
 Rack travel in mm : 5.3...5.5
 Del.quantity cm3/ : 4.1...4.7
 100 s: (3.9...4.9)
 Spread cm3 : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.30...1.60
 2nd speed rpm : 500
 travel mm : 3.40...4.00
 3rd speed rpm : 900
 travel mm : 6.70...6.90
 4th speed rpm : 1075
 travel mm : 8.40...8.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 900
 Aneroid pressure h: 900
 Del.quantity : 228.0...230.0
 1000 : (225.0...233.0)
 Spread cm3 : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 56...64

Testing:
1st rack travel in: 13.00
Speed rpm : 950...960
2nd rack travel in: 4.00
Speed rpm : 1100...1130
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 10...18

Testing:
Speed rpm : 275
Minimum rack travel: 6.90
Speed rpm : 325
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION
Speed rpm : 325...500

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 14.00...14.10
2nd speed rpm : 625
Rack travel in m: 13.80...14.00
3rd speed rpm : 500
Rack travel in m: 0.00...13.20

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 900
Pressure hPa : 900
Rack travel mm : 14.00...14.10

Measurement
Speed 1/min : 900

1st pressure hPa : -
Rack travel in m: 8.80...9.20
2nd pressure hPa : 225
Rack travel in m: 10.20...10.30
3rd pressure hPa : 545
Rack travel in m: 12.70...13.10

START CUT-OUT

Speed 1/min : 265 (275)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 625
Del.quantity cm3/ : 260.0...266.0
1000 s: (257.0...269.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 900
Speed rpm : 850
Del.quantity cm3/ : 159.0...161.0 *
1000 s: (136.5...157.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 166.0...170.0
1000 s: (164.0...172.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 13.00
Speed rpm : 950...960

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 10.40...10.80

LOW IDLE

Speed rpm : 325
Rack travel in mm : 5.30...5.50
Del.quantity cm3/ : 41.0...47.0
1000 s: (39.0...49.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5179-P2

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a7
Edition : 04.09.90
Replaces : 02.05.90
Test oil : ISO-4113

Combination no. : 0 402 746 838

Injection pump
Pump designation : PES6P120A720RS7157
EP type number : 0 412 726 814
Governor
Governor design. : RQV325...875PA848-14
K

Governor no. : 0 421 815 194

Customer-spec. information
Customer : MACK

Engine : EM7-250L 4VH

1st version kW : 187.0
Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow
quantity min. 1/h: 160...170

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

NO9

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
: (2.70...2.90)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing :

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 10.40...10.50

Del.quantity cm3/ : 17.4...17.6

100 s: (17.1...17.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...4.9

Del.quantity cm3/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.30...1.60

2nd speed rpm : 500

travel mm : 3.40...4.00

3rd speed rpm : 900

travel mm : 6.70...6.90

4th speed rpm : 1075

travel mm : 8.40...8.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 900

Del.quantity : 174.0...176.0

1000 : (171.0...179.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 54...62

Testing:
1st rack travel in: 9.40
Speed rpm : 915...925
2nd rack travel in: 4.00
Speed rpm : 1020...1050
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 12...20

Testing:
Speed rpm : 275
Minimum rack travel: 6.30
Speed rpm : 325
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 10.40...10.50
2nd speed rpm : 510
Rack travel in m: 11.90...12.10
3rd speed rpm : 450
Rack travel in m: 0.00...11.80

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 510
Pressure hPa : 900
Rack travel mm : 11.90...12.10

Measurement
Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 7.80...8.20
2nd pressure hPa : 235
Rack travel in m: 8.80...8.90
3rd pressure hPa : 485
Rack travel in m: 10.80...11.20

START CUT-OUT

Speed 1/min : 275 (285)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 510
Del.quantity cm3/ : 244.0...250.0
1000 s: (241.0...253.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 900
Speed rpm : 850
Del.quantity cm3/ : 159.0...161.0 *
1000 s: (136.5...157.0)
Speed rpm : 400
Del.quantity cm3/ : 151.0...155.0
1000 s: (149.0...157.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.40
Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 10.10...10.30

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.70...4.90
Del.quantity cm3/ : 40.0...46.0
1000 s: (38.0...48.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5179-P26

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.
Bow dimension:
Sliding-sleeve position = 37.0 mm
Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 b
 Edition : 04.09.90
 Replaces : 02.05.90
 Test oil : ISO-4113
 Combination no. : 0 402 746 839
 Injection pump
 Pump designation : PES6P120A720RS7148
 EP type number : 0 412 726 810
 Governor
 Governor design. : RQV325...875PA848-19
 K
 Governor no. : 0 421 815 199

Customer-spec. information
 Customer : MACK

Engine : EM7 300L 4VH

1st version kW : 224.0
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 6.00...8.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875
 Rack travel in mm : 11.50...11.60
 Del.quantity cm3/ : 21.0...21.2
 100 s: (20.7...21.5)
 Spread cm3 : 0.5
 100 s: (0.9)
 2nd speed rpm : 325.0
 Rack travel in mm : 4.5...4.7
 Del.quantity cm3/ : 4.1...4.7
 100 s: (3.9...4.9)
 Spread cm3 : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40
 2nd speed rpm : 450
 travel mm : 2.50...2.80
 3rd speed rpm : 600
 travel mm : 4.10...4.30
 4th speed rpm : 875
 travel mm : 7.30...7.50
 5th speed rpm : 1000
 travel mm : 8.70...9.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 875
 Aneroid pressure h: 1200
 Del.quantity : 210.0...212.0
 1000 : (207.0...215.0)

Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 57...65

Testing:
1st rack travel in: 10.50
Speed rpm : 915...925
2nd rack travel in: 4.00
Speed rpm : 1000...1030
4th rack travel in: 1150
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 8...16

Testing:
Speed rpm : 275
Minimum rack travel: 6.10
Speed rpm : 325
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 11.50...11.60
2nd speed rpm : 510
Rack travel in m: 16.00...16.20
3rd speed rpm : 800
Rack travel in m: 12.00...12.20
4th speed rpm : 600
Rack travel in m: 15.10...15.30
5th speed rpm : 450
Rack travel in m: 0.00...15.70

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 16.00...16.20

Measurement
Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.70...9.10
2nd pressure hPa : 325

Rack travel in m: 10.60...10.70
3rd pressure hPa : 815
Rack travel in m: 14.30...14.70

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm3/ : 294.0...300.0
1000 s: (291.0...303.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 1200
Speed rpm : 875
Del.quantity cm3/ : 199.0...201.0 *
1000 s: (166.0...191.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 166.0...170.0
1000 s: (164.0...172.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.50
Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 165.0...185.0
1000 s: (155.0...195.0)
Rack travel in mm : 8.70...9.10

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.50...4.70
Del.quantity cm3/ : 41.0...47.0
1000 s: (39.0...49.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks: : MACK # 313GC5179-P6

Delivery-valve spring pre-tension
3.0...3.2 mm.

* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a12
 Edition : 04.09.90
 Replaces : 02.05.90
 Test oil : ISO-4113
 Combination no. : 0 402 746 840
 Injection pump
 Pump designation : PES6P120A72ORS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...875PA848-18
 K
 Governor no. : 0 421 815 198

Customer-spec. information
 Customer : MACK

Engine : EMC6 250L 4VH

1st version kW : 187.0
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.20...11.30

Del.quantity cm3/ : 17.3...17.5

100 s: (17.0...17.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40

2nd speed rpm : 450
 travel mm : 2.80...3.20

3rd speed rpm : 850
 travel mm : 6.20...6.40

4th speed rpm : 1000
 travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 173.0...175.0

1000 : (170.0...178.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 54...52

Testing:

1st rack travel in: 10.20

Speed rpm : 915...925

2nd rack travel in: 4.00

Speed rpm : 1010...1040

4th rack travel in: 1100

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 9...17

Testing:

Speed rpm : 275

Minimum rack travel: 1.50

Speed rpm : 325

Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 875

Rack travel in m: 11.20...11.30

2nd speed rpm : 510

Rack travel in m: 13.10...13.30

3rd speed rpm : 700

Rack travel in m: 12.00...12.20

4th speed rpm : 450

Rack travel in m: 0.00...13.10

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 510

Pressure hPa : 1200

Rack travel mm : 13.10...13.30

Measurement

Speed 1/min : 510

1st pressure hPa : -

Rack travel in m: 9.10...9.50

2nd pressure hPa : 215

Rack travel in m: 10.30...10.40

3rd pressure hPa : 435

Rack travel in m: 12.20...12.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 510

Del.quantity cm³/ : 239.0...245.0

1000 s: (236.0...248.0)

Spread cm³ : 8.00

1000 s: (12.0)

Aneroid pressure h: 1200

Speed rpm : 850

Del.quantity cm³/ : 159.0...161.0 *

1000 s: (141.5...162.5)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm³/ : 146.0...150.0

1000 s: (144.0...152.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.20

Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm³/ : 160.0...200.0

1000 s: (150.0...210.0)

Rack travel in mm : 9.10...9.50

LOW IDLE

Speed rpm : 325

Rack travel in mm : 4.50...4.70

Del.quantity cm³/ : 39.0...45.0

1000 s: (37.0...47.0)

Spread cm³ : 8.00

1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P32

Delivery-valve spring pre-tension
3.0...3.2 mm.

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Bow dimension:
Sliding-sleeve position = 37.0 mm



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 e
Edition : 04.05.90
Replaces : 02.05.90
Test oil : ISO-4113

Combination no. : 0 402 746 842

Injection pump
Pump designation : PES6P120A720RS7164
EP type number : 0 412 726 816
Governor
Governor design. : RQV325...875PA848-17
K

Governer no. : 0 421 815 200

Customer-spec. information
Customer : MACK TRUCKS

Engine : EMC6 300L 4VH

1st version kw : 200.0
Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 2 417 413 011

Overflow
quantity min. 1/h: 160...170

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

N17

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
: (2.70...2.90)
Rack travel in mm : 12.00...13.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
Phasing :
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875
Rack travel in mm : 14.90...15.00
Del.quantity cm3/ : 22.5...22.7
100 s: (22.3...22.9)
Spread cm3 : 0.5
100 s: (0.9)

2nd speed rpm : 325.0
Rack travel in mm : 4.7...4.9
Del.quantity cm3/ : 3.9...4.5
100 s: (3.7...4.7)
Spread cm3 : 0.8
100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
travel mm : 1.20...1.40
2nd speed rpm : 450
travel mm : 3.00...3.40
3rd speed rpm : 850
travel mm : 5.90...6.10
4th speed rpm : 1000
travel mm : 7.40...7.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 875
Aneroid pressure h: 1200
Del.quantity : 225.0...227.0
1000 : (223.0...229.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 54...62

Testing:
1st rack travel in: 13.90
Speed rpm : 915...925
2nd rack travel in: 4.00
Speed rpm : 1065...1095
4th rack travel in: 1160
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 10...18

Testing:
Speed rpm : 275
Minimum rack travel: 5.90
Speed rpm : 325
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 14.90...15.00
2nd speed rpm : 510
Rack travel in m: 16.90...17.10
3rd speed rpm : 700
Rack travel in m: 15.70...15.90
4th speed rpm : 600
Rack travel in m: 16.60...16.80
5th speed rpm : 420
Rack travel in m: 0.00...16.80

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 16.90...17.10

Measurement
Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 10.90...11.30
2nd pressure hPa : 375
Rack travel in m: 12.70...12.80
3rd pressure hPa : 735
Rack travel in m: 15.70...16.10

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm3/ : 307.0...313.0
1000 s: (304.0...316.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 1200
Speed rpm : 875
Del.quantity cm3/ : 179.0...181.0 *
1000 s: (151.0...175.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 156.0...160.0
1000 s: (154.0...162.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.90
Speed rpm : 915...925

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 160.0...200.0
1000 s: (150.0...210.0)
Rack travel in mm : 10.90...11.30

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.70...4.90
Del.quantity cm3/ : 39.0...45.0
1000 s: (37.0...47.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:
: MACK # 313GC5181P14

Delivery-valve spring pre-tension
3.0...3.2 mm.

* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.
Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

Bow dimension:
Sliding-sleeve position = 37.0 mm



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a15
 Edition : 04.09.90
 Replaces : 02.05.90
 Test oil : ISO-4113

Combination no. : 0 402 746 846

Injection pump
 Pump designation : PES6P120A72ORS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...850PA848-23
 K
 Governor no. : 0 421 815 204

Customer-spec. information
 Customer : MACK TRUCKS

Engine : E6 300 4VH

1st version kW : 224.0
 Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm3/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm3/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 200.0...202.0

1000 : (197.0...205.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 50...58

Testing:

1st rack travel in: 11.90

Speed rpm : 900...910

2nd rack travel in: 4.00

Speed rpm : 1025...1055

4th rack travel in: 1100

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 7...15

Testing:

Speed rpm : 275

Minimum rack travel: 1.50

Speed rpm : 325

Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 850

Rack travel in m: 12.90...13.00

2nd speed rpm : 700

Rack travel in m: 13.60...13.70

3rd speed rpm : 600

Rack travel in m: 13.80...13.90

4th speed rpm : 500

Rack travel in m: 0.00...13.60

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 600

Pressure hPa : 900

Rack travel mm : 13.80...13.90

Measurement

Speed 1/min : 600

1st pressure hPa : -

Rack travel in m: 10.30...10.50

2nd pressure hPa : 250

Rack travel in m: 11.20...11.30

3rd pressure hPa : 475

Rack travel in m: 12.90...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 600

Del.quantity cm3/ : 237.0...243.0

1000 s: (234.0...246.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 900

Speed rpm : 850

Del.quantity cm3/ : 159.0...161.0 *

1000 s: (141.5...162.5)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 154.0...158.0

1000 s: (152.0...160.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.90

Speed rpm : 900...910

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 195.0...235.0

1000 s: (185.0...245.0)

Rack travel in mm : 10.30...10.50

LOW IDLE

Speed rpm : 325

Rack travel in mm : 4.50...4.70

Del.quantity cm3/ : 32.0...38.0

1000 s: (30.0...40.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

: MACK # 313GC5184-P6

Delivery-valve spring pre-tension
3.0...3.2 mm.

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a16
Edition : 04.09.90
Replaces : 02.05.90
Test oil : ISO-4113

Combination no. : 0 402 746 847

Injection pump
Pump designation : PES6P120A720RS7135
EP type number : 0 412 726 807
Governor
Governor design. : RQV325...850PA878-8K
Governor no. : 0 421 815 205

Customer-spec. information
Customer : MACK TRUCKS

Engine : E6 300 4VH

1st version kW : 224.0
Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 2 417 413 011

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 160...170

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
: (2.70...2.90)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm³/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm³/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 200.0...202.0

1000 : (197.0...205.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 50...58

Testing:

1st rack travel in: 11.90

Speed rpm : 900...910

2nd rack travel in: 4.00

Speed rpm : 1025...1055

4th rack travel in: 1100

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 7...15

Testing:

Speed rpm : 275

Minimum rack travel: 6.10

Speed rpm : 325

Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 850

Rack travel in m: 12.90...13.00

2nd speed rpm : 700

Rack travel in m: 13.60...13.70

3rd speed rpm : 600

Rack travel in m: 13.80...13.90

4th speed rpm : 500

Rack travel in m: 0.00...13.60

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 600

Pressure hPa : 900

Rack travel mm : 13.80...13.90

Measurement

Speed 1/min : 600

1st pressure hPa : -

Rack travel in m: 10.30...10.50

2nd pressure hPa : 250

Rack travel in m: 11.20...11.30

3rd pressure hPa : 475

Rack travel in m: 12.90...13.30

FUEL DELIVERY CHARACTERISTICS

N23

1st version

Aneroid pressure h: 900

Speed rpm : 600

Del.quantity cm3/ : 237.0...243.0

1000 s: (234.0...246.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 900

Speed rpm : 850

Del.quantity cm3/ : 159.0...161.0 *

1000 s: (141.5...162.5)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 154.0...158.0

1000 s: (152.0...160.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.90

Speed rpm : 900...910

INTERMEDIATE RATED SPEED

Rack travel in mm : 12.20

Speed rpm : 805

Rack travel in mm : 4.60

Speed rpm : 300

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 195.0...235.0

1000 s: (185.0...245.0)

Rack travel in mm : 10.30...10.50

LOW IDLE

Speed rpm : 325

Rack travel in mm : 4.50...4.70

Del.quantity cm3/ : 32.0...38.0

1000 s: (30.0...40.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

: MACK # 313GC5184-P8

Delivery-valve spring pre-tension

3.0...3.2 mm.

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment,

check value for engine equipment.
Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a17
 Edition : 04.09.90
 Replaces : 02.05.90
 Test oil : ISO-4113

Combination no. : 0 402 746 848

Injection pump
 Pump designation : PES6P120A720RS7135
 EP type number : 0 412 726 807
 Governor
 Governor design. : RQV325...900PA878-9K
 Governor no. : 0 421 815 206

Customer-spec. information
 Customer : MACK TRUCKS INC.

Engine : E6-350

1st version kW : 261.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.80...14.90

Del.quantity cm3/ : 24.8...25.0

100 s: (24.5...25.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.9...5.1

Del.quantity cm3/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40

2nd speed rpm : 450
 travel mm : 3.10...3.30

3rd speed rpm : 850
 travel mm : 5.90...6.10

4th speed rpm : 1000
 travel mm : 7.50...7.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 248.5...250.5

1000 : (245.5...253.5)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 56...64

Testing:

1st rack travel in: 13.80
Speed rpm : 950...960
2nd rack travel in: 4.00
Speed rpm : 1075...1105
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 7...15

Testing:

Speed rpm : 275
Minimum rack travel: 6.60
Speed rpm : 325
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 14.80...14.90
2nd speed rpm : 625
Rack travel in m: 15.20...15.30
3rd speed rpm : 700
Rack travel in m: 15.00...15.10
4th speed rpm : 500
Rack travel in m: 0.00...14.90

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 625
Pressure hPa : 1200
Rack travel mm : 15.20...15.30

Measurement

Speed 1/min : 625

1st pressure hPa : -
Rack travel in m: 8.30...8.70
2nd pressure hPa : 310
Rack travel in m: 10.20...10.30
3rd pressure hPa : 710
Rack travel in m: 13.70...14.10

FUEL DELIVERY CHARACTERISTICS

N26

1st version

Aneroid pressure h: 1200
Speed rpm : 625
Del.quantity cm3/ : 271.0...277.0
1000 s: (268.0...280.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 1200
Speed rpm : 850
Del.quantity cm3/ : 159.0...161.0 *
1000 s: (141.5...162.5)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 130.5...134.5
1000 s: (128.5...136.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.80
Speed rpm : 950...960

INTERMEDIATE RATED SPEED

Rack travel in mm : 14.00
Speed rpm : 850
Rack travel in mm : 5.00
Speed rpm : 300

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...170.0
1000 s: (120.0...180.0)
Rack travel in mm : 8.30...8.70

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.90...5.10
Del.quantity cm3/ : 39.0...45.0
1000 s: (37.0...47.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5184-P12

Delivery-valve spring pre-tension
3.0...3.2 mm.

* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,

check value for engine equipment.
Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

